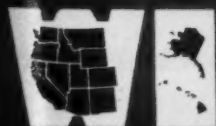


western industry



MARCH

1960



featuring: RADIO CONTROL FOR
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STANDARD ENGINEER'S FIELD REPORT

Chevron
PRODUCT **Multi-Machine Oil ICH**
FIRM **Roma Wine Company**
Fresno, California

Compressor in service 10 years without repairs



This 40-ton Cyclops Ammonia Compressor is still operating efficiently after more than 10 years' continuous service using Chevron Multi-Machine Oil ICH (formerly Calol). Maintenance superintendent Joe Kovacevich, who is reading head and back pressure gauges (above), reports compressor has not required any repairs during this entire time.

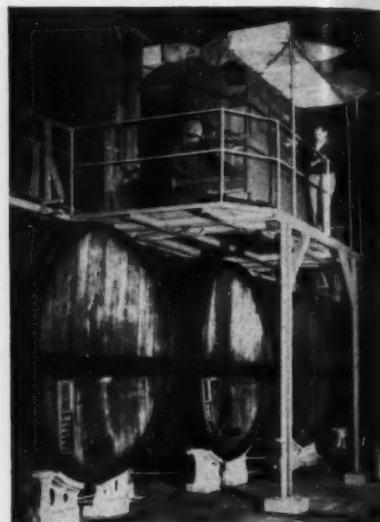
Chevron Multi-Machine Oil ICH is also used in winery's 12 other compressors. These refrigerate wine to accelerate aging and solidify impurities to permit filtering. Valves in compressors occasionally need grinding or replacement, but lower assemblies average 7 to 8 years of almost continuous service before needing repairs of any kind, reports Mr. Kovacevich.



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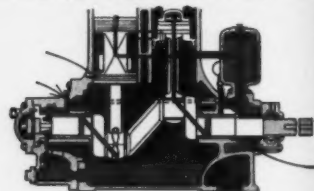
STANDARD OIL COMPANY OF CALIFORNIA

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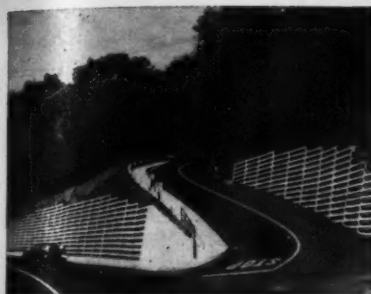
Blower Units keep oak casks at 45°F to hasten aging of wine. Compressor using Chevron Multi-Machine Oil ICH (described at left) serves three of these Niagara blowers.

Why Chevron Multi-Machine Oil ICH reduces maintenance on bearings, pumps and compressors

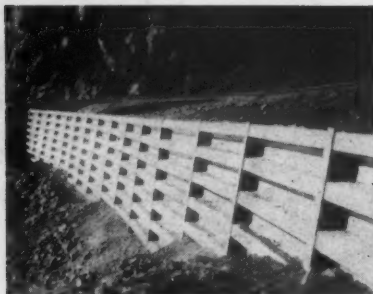


- Resists formation of deposits; has extremely low pour point
- Metal-wetting ability keeps oil on bearings under heaviest loads
- Separates rapidly from water and contaminants
- Assures efficient seal of stuffing box glands

For More Information on this product or a copy of the new free catalog: "A Lubricant Reference Guide to Economical Equipment Operation," call your Standard Engineer or Representative, or write 225 Bush St. San Francisco 20, California.



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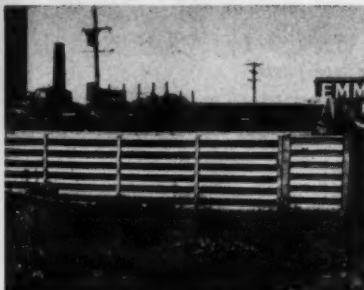
Replacing Existing Wall?



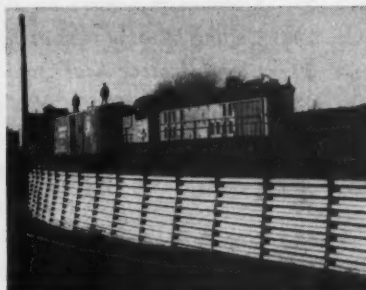
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MARCH - 1960
Vol. 25 No. 3



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COVER PHOTO *Hot strip mill at Kaiser Steel Fontana plant. Steel slabs travel 1,245 ft. from furnace through 11 rolling mills to coiler in two minutes. See page 44.*

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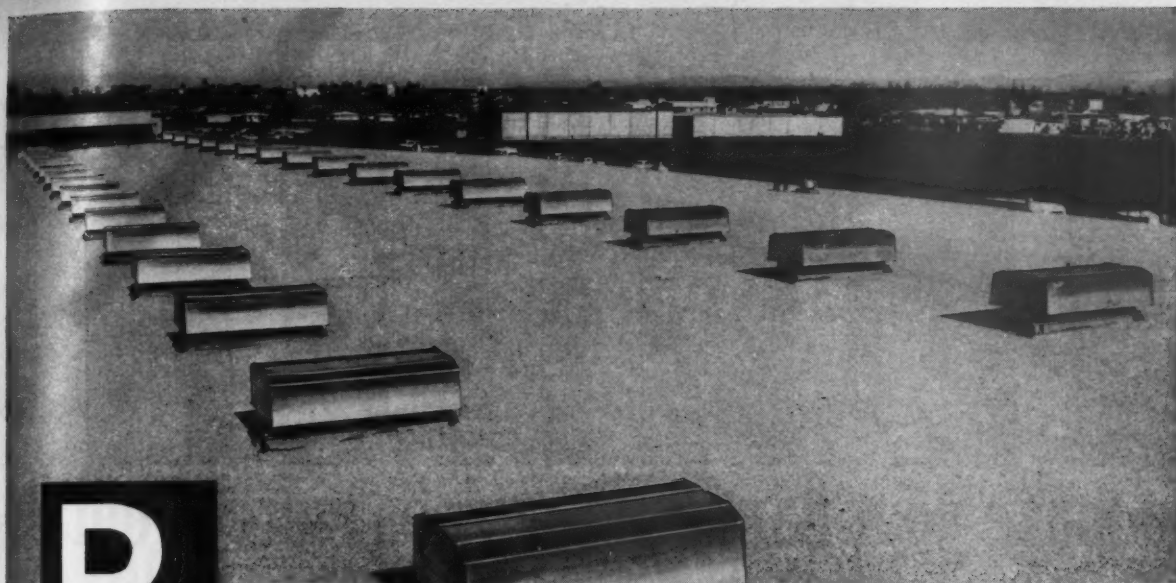
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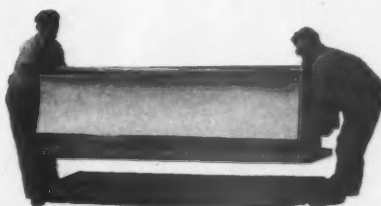
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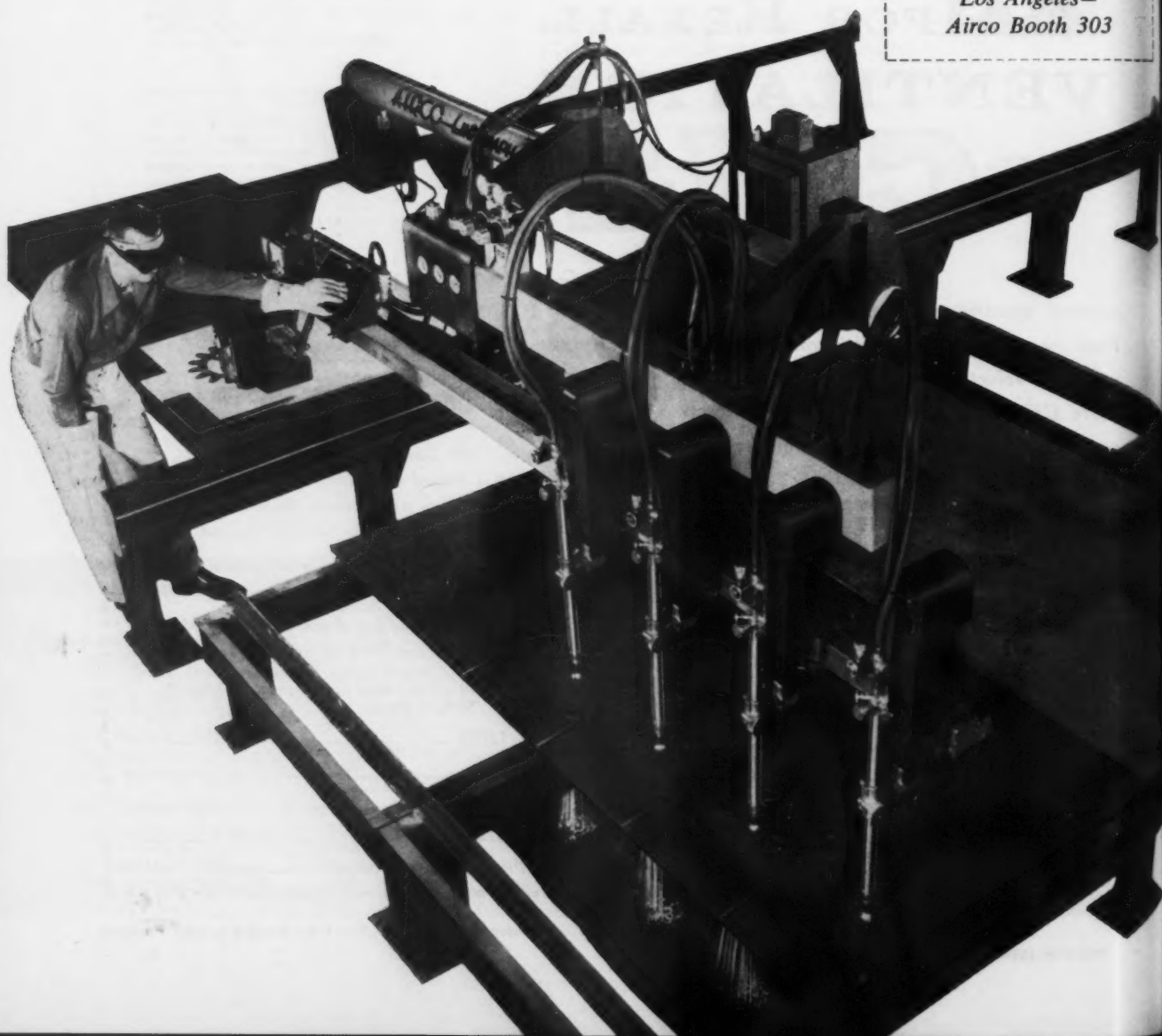
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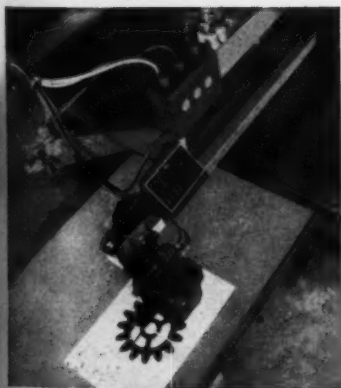
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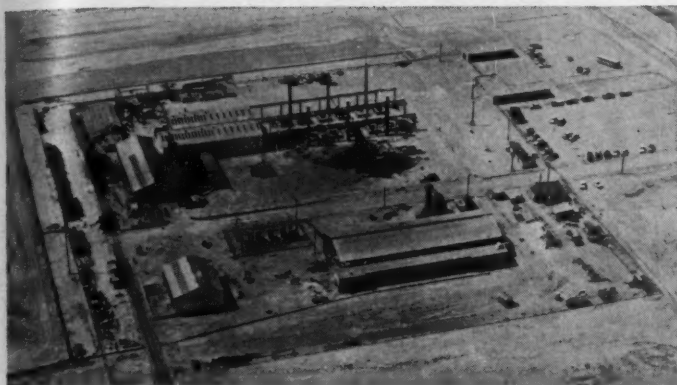
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WESTERN INDUSTRY/MARCH 1960

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Plans now under way at the GLC graphite plant, Antelope Valley, California, call for a substantially increased inventory of electrodes, anodes and mold stock, not only in tonnage but in a variety of shapes and sizes as well. Customers can look forward to faster service on their shipments and to closer cooperation in solving their technical problems.

Technicians from our plants at Niagara Falls, N. Y. and Morganton, N. C. are establishing the most modern production techniques at the Antelope Valley plant, so that its products will meet established GLC standards of quality and uniformity.

As these forward steps are taken, we hope to have the privilege of widening the scope of our service to customers, old and new.



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western meetings

3rd Western Regional Material Handling Show & Packaging Cavalcade — May 11, 12, 13



COMPLETING FINAL DETAILS for the 3rd Western Regional Material Handling Show May 11, 12, 13 at the Great Western Exhibit Center, Santa Ana Freeway and Atlantic Boulevard, Los Angeles, are these officials of the Los Angeles chapter. Left to right are: W. B. Semco, W. B. Semco & Associates President, Los Angeles Chapter, AMHS; A. E. Flinck, Ford Motor Company, show chairman; Don Ferguson, Robert H. Braun Company; A. Byron Perkins, show director and producer; John Morris, show manager; Robert H. Braun, Jr., Robert H. Braun Company.

Plans Finalized for AMHS - SPHE Technical Conference to be Held During Show.

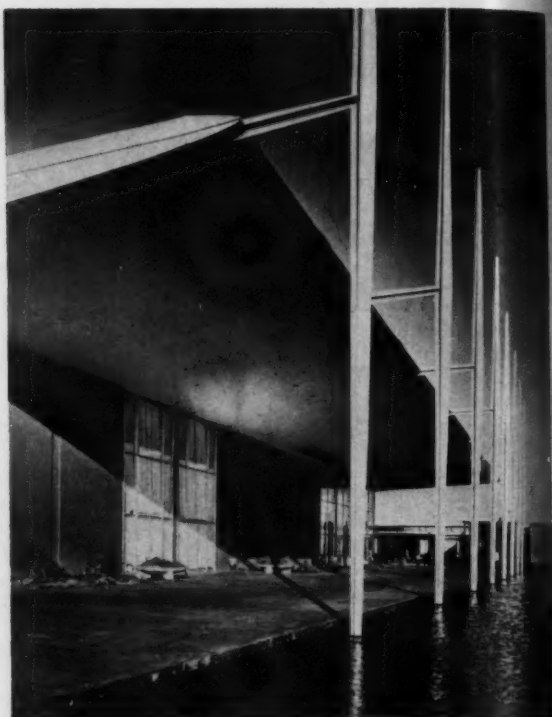
PLANS ARE BEING finalized for the joint American Material Handling Society and Society of Packaging and Handling Engineers technical conference scheduled May 10-11 at the new Chrysler Corp. Training Center, 1111 N. Brookhurst, Anaheim, Calif.

The sessions are being held in conjunction with the third Western Regional Material Handling Show, Packaging, Shipping Cavalcade, May 11-13, at the Great Western Exhibit Center.

The two-day program is featuring six major topics under the general title, "Integration of Handling and Packaging." Three topics will be covered daily. Offered May 10 will be, "Overhaul It-Replace It?", "Freight by Air", a discussion of the Air Force Handling system 463-L for mass movement of air freight, and "Put Snap Into Order Picking."

Second day topics will be, "Palletize—Why?", "Use That Space—Save Those Dollars", and "Packaged for Better Handling", covering design of packaging to enable handling as a unit.

On both days registration and a coffee session begins at



SITE OF AMHS HANDLING PACKAGING CONFERENCE, May 10-11, is the Chrysler Corp. Training Center, 1111 N. Brookhurst, Anaheim, Calif. The two day conference will feature six trophies, is co-sponsored by the SPHE. General title of the meeting is "The Integration of Handling and Packaging."

8 a.m. Introductions will end by 9:15 a.m. with start of the first session that concludes at 10:15 with a ten minute break. Session two lasts until noon and after a 30-minute intermission a luncheon session is held until 2:15 p.m. The final session then begins and concludes at 4 p.m. Tickets for one session are \$15.00, for both sessions \$25.00. Ticket requests may be made to 2807 Sunset Blvd., Los Angeles 26, Calif., care of the American Material Handling Society.



CONFERENCE COMMITTEEMEN HUDDLE over last minute plans for the joint AMHS-SPHE technical sessions. From left, Henry Cooper, Northrup Corp.; Robert Braun, Jr., R. H. Braun Co.; Ben Hart, Torrington Mfg. Co.; Tom Brown, Exide Battery; Warren Burman, Hyster Co.; Dick Shubert, Gould National Batteries; and Chuck Shibel, Southern California Gas Company, L.A., Calif.



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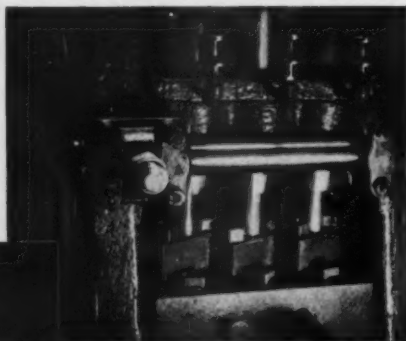


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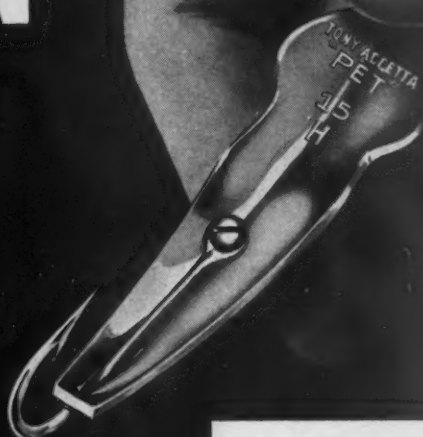
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MEETINGS

(continued)

Material Handling Meeting

DESIGN OF PACKAGING to protect products from damage during materials handling operations was discussed by William H. Grumet, division manager, American Laboratories, a Fullerton, Calif. reliability testing concern, during the February meeting of the American Material Handling Society in Los Angeles.



NOBLE JONES, right, president of the Southern California Chapter, SPHE, introduces William H. Grumet, who addressed AMHS membership on design of shock-proof packaging.

Grumet told assembled AMHS members that the stress subjected to the packaged product during handling operations may be far greater than the design of the product calls for. It may far exceed the most extreme stress found in the operational environment, he added.

This is especially true of delicate defense items, many destined for use in missile and airframe applications.

He concluded by describing a number of testing facilities available at Fullerton, among them a shock tower and an environmental test station to duplicate extremes of weather.

Grumet was introduced by Noble Jones, president of the Southern California Chapter, Society of Packaging and Handling Engineers, and a logistics service consultant for American Laboratories.

Also present was A. Byron Perkins, show manager for the May 11-13 Material Handling Show and Packaging Cavalcade slated for the Great Western Exhibit Hall in Los Angeles.

Perkins summarized up-to-the minute plans for the event and offered members information on space rates and other facets of the show.

Don Ferguson, Robert H. Braun Co., introduced the technical session on "Unit Handling by Conveyor" that was conducted by panelists Jack Peters, Jervis B. Webb Co.; Jayson Young, Mathews Conveyor; and Jack Howitt, E. A. Stevenson Co. (Rapistan).



ADDRESSING AMHS MEMBERS informally from the floor, A. Byron Perkins, AMHS Show manager gives information on booth space for the event on May 11-13 in Los Angeles.

Power Instrumentation Symposium To Be Held in San Francisco

SEVERAL HUNDRED of the top operating personnel of the nation's public and government-operated power plants will take part in the 3rd Annual Power Instrumentation Symposium to be held in San Francisco, May 9-11, under the auspices of the Power Industry Division of the Instrument Society of America.

Theme of the sessions, all of which will be held in San Francisco State College, is "Progress in Control Systems." Keynote speaker will be W. L. Chadwick, vice-president, Southern California Edison Company. E. C. Kistner, of the Philadelphia (Pa.) Electric Company, is Program Chairman.

The Instrument Society of America also will hold its Summer Instrument-Automation Conference and Exhibit in San Francisco May 9-12, simultaneously with, but separately from, the Power Instrumentation Symposium. The technical sessions of the Instrument-Automation Conference will be held in Civic Auditorium for the full four days. The Exhibit, featuring the latest instruments, controls and systems of nearly 200 of the nation's leading manufacturers, will be staged in Brooks Hall, adjacent to the Auditorium, May 10-12, inclusive.

Arizona Packaging Engineers Install New Officers for 1960

ARIZONA CHAPTER 23 of Society of Packaging and Handling Engineers has installed new officers for 1960-61. The new officers are: Chapter President William R. Blommel, president of Mechanical Equipment Company, Inc., Phoenix, Arizona; Vice-President Steve Cassidy, manager, customer relations, EPF Tool and Manufacturing Co., Tucson, Arizona; Vice-President of Materials Handling, Louis A. Edwards, district manager, Navajo Freight Lines, Phoenix; Secretary Russell M. Carr, materials expeditor, Arizona Public Service Company, Phoenix; and Treasurer Frank A. Beiderman, owner, Frank Beiderman Associates, Phoenix.

Arizona will be well represented at the 1960 National Championship Packaging Competition sponsored by the

New Western ideas in steel

Trailer by Rex Mobile Homes, McMinnville, Oregon



Quick-heating Comfort for Trailer Travel. On the road, or in the park—a dependable electric furnace by Montag, Inc., of Portland, keeps it warm and comfortable in this Spacemaster Trailer. The efficient unit is formed from consistent quality USS Cold Rolled Sheets. Anywhere in the West, USS Sheets—best choice for better products, styled in steel!



Jet Unloading at Space-age Pace. A trans-continental jet sets down at San Francisco. Unloading time for passengers and luggage? Five minutes! The new Jetway ramp does the trick. P I Steel Corporation built it with a weather-resistant, molded canopy of durable USS Sheets and husky legs of USS "T-1" Steel. Other materials were considered—but only steel could do the job so well.

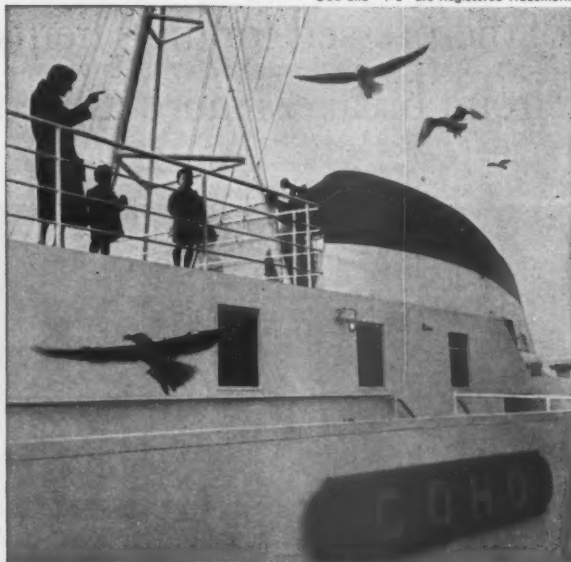
Lightens your work
Brightens your leisure
Widens your world



Wherever you go in the West—by land, air or water—you'll find USS Steel on the job in a thousand-and-one ways to make your trip more pleasant. No matter how varied your steel needs may be—your nearby United States Steel representative places the West's most complete line of steel products at your service.

STEEL FOR EVERY PURPOSE FROM A SINGLE SOURCE

USS and "T-1" are Registered Trademarks



Sea-going Beauty Fashioned in Steel. The good ship "Coho" plies Northwest waves with truck freight between Seattle and Victoria, B. C., and with automobiles and passengers between Port Angeles and Victoria. She's built for rugged duty in any waters with sturdy USS Steel Plate, by Puget Sound Bridge & Drydock Co. of Seattle.



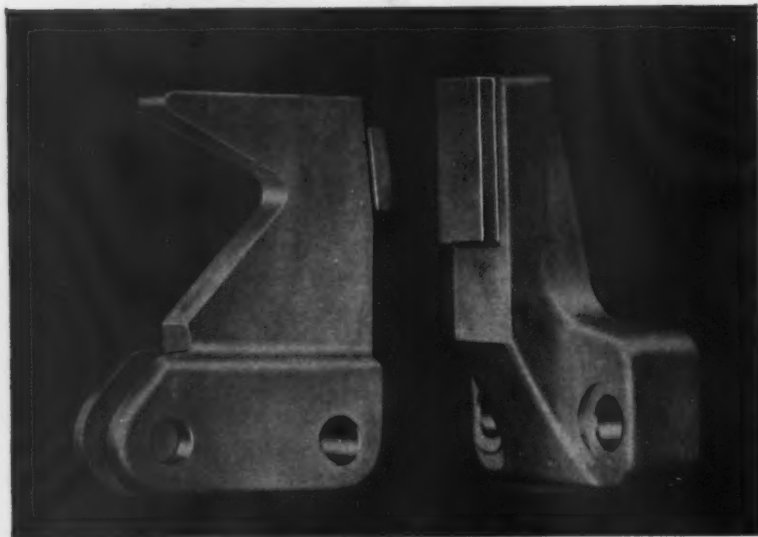
All-year, All-road Performance. When ski slopes are at their powder best—roads may be at their winter worst! But you can depend on good all-year performance over any road on wheels of USS Steel. Today, stronger, reliable auto wheels are formed from USS Hot Rolled Sheets by Norris-Thermador Corp., Los Angeles, to get you there and back smoothly and safely in spite of Old Man Winter.



Columbia-Geneva Steel
Division of
United States Steel

TWICE-WROUGHT METAL

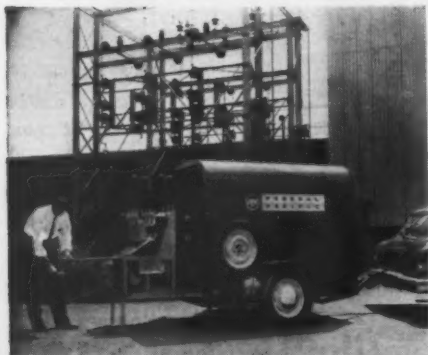
of die-pressed forgings helps Federal Pacific make new air circuit breakers more rugged—cuts machining costs in half



In its new Type DST magnetic air circuit breaker line, Federal Pacific Electric Company, Newark, N. J., builds in dependable operation and long life with parts of outstanding mechanical and adequate electrical properties.

Typical of this attention to detail are the arcing contacts (left). Similar parts previously used had been castings or built-up assemblies. Now the contact bodies are Anaconda Forging Brass-250 die-pressed forgings. The twice-wrought metal is denser, stronger, withstands mechanical shock better—reducing the fatigue factor and producing longer service life. The contacts also have higher conductivity. And best of all, their consistent dimensional accuracy and smooth finish cut machining costs in half.

RIGHT: Movable arcing contact assemblies at the left and the stationary arcing contact assemblies at the right in a 5-kv Federal Pacific Type DST air circuit breaker. They have a momentary current-carrying capacity of 60,000 amperes. Contact tips of tungsten alloy are silver-soldered to the forgings. These are two of several areas where Federal Pacific uses the superior physical properties of Anaconda die-pressed forgings to help provide dependable operation and long service life in its line of metal-clad switchgear.



Federal Pacific takes its circuit breakers out to industrial and electric utility customers. Here a representative sets up a demonstration of a 5-kv, 1,200-amp breaker in the field.

IT is often easier than you think to achieve high quality and performance while simplifying fabrication and cutting over-all costs. American Brass technical specialists are constantly working with designers, production engineers and buyers, helping them meet their joint requirements—through the use of such Anaconda mill products as die-pressed forgings, extruded shapes, special-shape tubes. For this kind of practical help, see your American Brass representative or write: The American Brass Company, 14900 Garfield Ave., Paramount, California. In Canada: Anaconda American Brass Ltd., New Toronto, Toronto 14, Ontario. ©1960

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WESTERN INDUSTRY/MARCH 1960

MEETINGS

(continued)

Society of Packaging & Handling Engineering, and to be held in conjunction with the AMHE-SPHE Materials Handling and Shipping Cavalcade in Los Angeles, May 11 through 13. Lou Tressler, traffic manager, Sperry, Phoenix, and Steve Cassidy, EPF Tool and Manufacturing Co., Tucson, both members of Chapter 23, will serve as judges.

Welding Show Obtains Additional Space

THE AMERICAN WELDING SOCIETY has obtained additional space at the Great Western Exhibit Center, Los Angeles, for the 41st Annual Convention and Welding Show, April 25-29, 1960.



ATTENDING EXECUTIVE MEETING for forthcoming 41st American Welding Society Convention and Welding Show to be held in Los Angeles are, left to right: E. Dato of Linde, AWS National Convention Committeeman; Francis McGinley, Victor Equipment Co., Chairman of Banquet Committee; Dick Hayes of Aerojet General, Chairman AWS Section; C. P. Sanders, Consolidated Western Steel, Chairman AWS Local Arrangements Committee; A. L. Phillips, AWS National Secretary of Education and Information; and R. T. Kenworthy, AWS National Exhibition Chairman.

Additional space was needed to fulfill the requirements of exhibitors. An estimated \$3,000,000 worth of welding equipment is already scheduled to be on view and applications for space continue. Many unique examples of modern welded construction will be on view, including a unitized welded automobile chassis and welded products from local industries. The very latest in metal cutting equipment will be given and products and equipment under development at present will be revealed for the first time.

The Technical Sessions will be held in the Biltmore Hotel, Los Angeles, and will consist of 23 sessions at which 69 papers will be given on the latest developments and research projects in the welding industry.

Investment Casters Meeting

THE INVESTMENT CASTERS SOCIETY's monthly meeting was attended by the largest turnout of the year. The program was started by Bill James, Technical Director, Wai-Met Alloys, Division of Howe Sound Corporation. He discussed the possible developments that can result from ASTM's March convention. The most interesting note was the suggestion that the specifications for 17-4 were going to be revised and considerably improved.

Feature speaker was Hank Howan, president of Inductotherm Corporation, Delanco, New Jersey. Speaking on "Efficient Induction Melting," he presented a detailed cost analysis comparing the use of a 20 KW spark gap unit with a 30 and 50 KW motor generator unit.

Western Technical Convention On Military Electronics

THE FIRST WESTERN technical convention on military electronics was staged at the Los Angeles Biltmore last month under sponsorship of the Professional Group on Military Electronics of the Institute of Radio Engineers and featured a 20-session program on engineering problems connected with satellite communications.

More than 4000 delegates attended the three-day affair, heard 90 technical papers, toured more than 100 exhibits, and joined a series of luncheon and dinner programs featuring key speakers.

Three of the nation's top military electronics spokesmen: James M. Bridges, Dept. of Defense; Lt. Gen. Arthur G. Trudeau, chief, R&D, Dept. of the Army; and Maj. Gen. O. J. Ritland, commander, Air Force Ballistic Missile Div., Air Research and Development Command, addressed the assembly.

Among Western exhibitors were Motorola Inc., Micro Gee Products Inc., Convair, Consolidated Electrodynamics, Garrett Corp., Lear Inc., Lockheed Missile and Space Div., Westinghouse, and Thompson-Ramo Wooldridge.

Offering an unusual touch to opening ceremonies was introduction of a Bendix Aviation Corp. computer whose electronic beeps were harnessed and amplified into tones for renditions of Anchors Aweigh, the Marine Hymn, Army and Air Force tunes and finally the Star Spangled Banner.

Regional Conference on Refractory Metals Planned by Los Angeles Chapter ASM

SPARKED BY THE success of the Molybdenum Fabrication Conference held in Los Angeles two years ago, the Los Angeles Chapter, American Society for Metals, has arranged a Regional Conference to be held Thursday and Friday, May 12th and 13th, at Santa Monica, California, dealing with one of the most important groups of materials in defense technology—The Refractory Metals.

Committee Chairman and Los Angeles ASM Executive Committee member R. H. Gassner, Chief Metallurgist of the El Segundo Plant of Douglas Aircraft, and his Committee have virtually completed the program arrangements, which will include addresses by the leading authorities in the field from the Nation's industry, research centers, and government. Speakers representing industry are expected from Boeing Airplane Co., Allegheny Ludlum Steel Corp., Ladish Forge Co., Aerojet-General Corp., General Electric Co., and Marquardt Corp. Government agencies will be represented by speakers from the Lewis Flight Propulsion Laboratory (NASA), Bureau of Aeronautics, National Research Council, and the Jet Propulsion Laboratory of California Institute of Technology. Representatives of Armour Research Institute, Southern Research Institute, and Battelle Memorial Institute will discuss work in the field done at these important research centers.

The selection of The Refractory Metals as the theme of the Conference is a recognition of the rapidly growing im-

MEETINGS

(Continued)

portance of these metals in space and missile technology. Although molybdenum, columbium, tungsten, rhodium, rhenium, and tantalum have been known in the past to metallurgists as alloying additions to other metals, the emergence of these materials as structural members in themselves has been of recent origin. Because of the pressure of time in the defense field concentrated attention to these metals has telescoped the normal progress of their development, but there still remains much to be learned about them and how they can be used most effectively.

To be held at the Hotel Del Mar in Santa Monica, the Conference will offer an opportunity to obtain the latest and most authoritative information available on these important metals, to those responsible for the selection, manufacture, and application of materials to satisfy the new and stringent performance requirements necessary for effective and economical progress in space terminology.

Electronic Manufacturers Elect Officers



NEW OFFICERS of the Western Electronic Manufacturers Association who will serve until January 1961 are: seated left to right, Spencer H. Bellue, president (Hughes Aircraft Company); A. N. Curtiss, treasurer (West Coast Missile & Surface Radar Division, Radio Corporation of America); standing, left to right, E. T. Clare, vice president (Convair Astronautics); M. R. Dilling, vice president (Tally Register Corporation); Samuel A. Ferguson, vice president (Sylvania Electronic Systems). Absent is Gould Hunter, secretary (Eitel-McCullough).

How To Sell To the Army Explained at Meeting

The fact that many Southern California firms do not know how to do business with the Army Ordnance District was made clear to more than 200 businessmen by Col. Paul H. Scordas, chief of the Los Angeles District, during a recent Chamber of Commerce luncheon.

Col. Scordas pointed out that many firms are capable of obtaining contracts but they have failed to register with the District office, 55 S. Grand Ave., Pasadena, Calif., and that some who have done so in the past have failed to update data regarding expanded facilities and production potential.

Data supplied by firms is used in determining just who will be invited to bid on current contracts. Old and incomplete information might disqualify a firm that has full capability, he said.

The Los Angeles district maintains a 'Bid Room' where current proposals are on file. This department also informs registered firms of contract possibilities lying in their chosen fields.

If firms will only let us know what they can or would like to manufacture, Col. Scordas said, we will send them notices when such items are up for bid.

The Bid Room is an excellent source of business, he said, and told of the recent visit of a plant representative who after a brief scanning of proposals wound up with a \$600,000 contract after competitively bidding.

The LA District has current jurisdiction over \$1.8 billions in contracts. This covers all of Southern Calif., parts of New Mexico, and all of Utah and Arizona.

More than 1600 contracts were active in Oct., for example, and 2/3 of them were for hardware, the remainder for research and development.

Not all of this competitive bidding is for missilery and other exotic defense items, Col. Scordas concluded. Commonplace items such as tools, gears, trucks, and even business machines are registered in the Bid Room.

Sanitation Group Holds Western Regional Meeting on March 31

THE INSTITUTE of Sanitation Management, Golden Gate Chapter (San Francisco Bay Area), announces its annual Western Regional Meeting will be held at the Claremont Hotel in Berkeley, California, on March 31, April 1 and 2.

The meeting will be of interest to all persons concerned in sanitation. There will be speakers from Federal and State regulating bodies, from various branches of the food industry, and from building maintenance and sanitation.

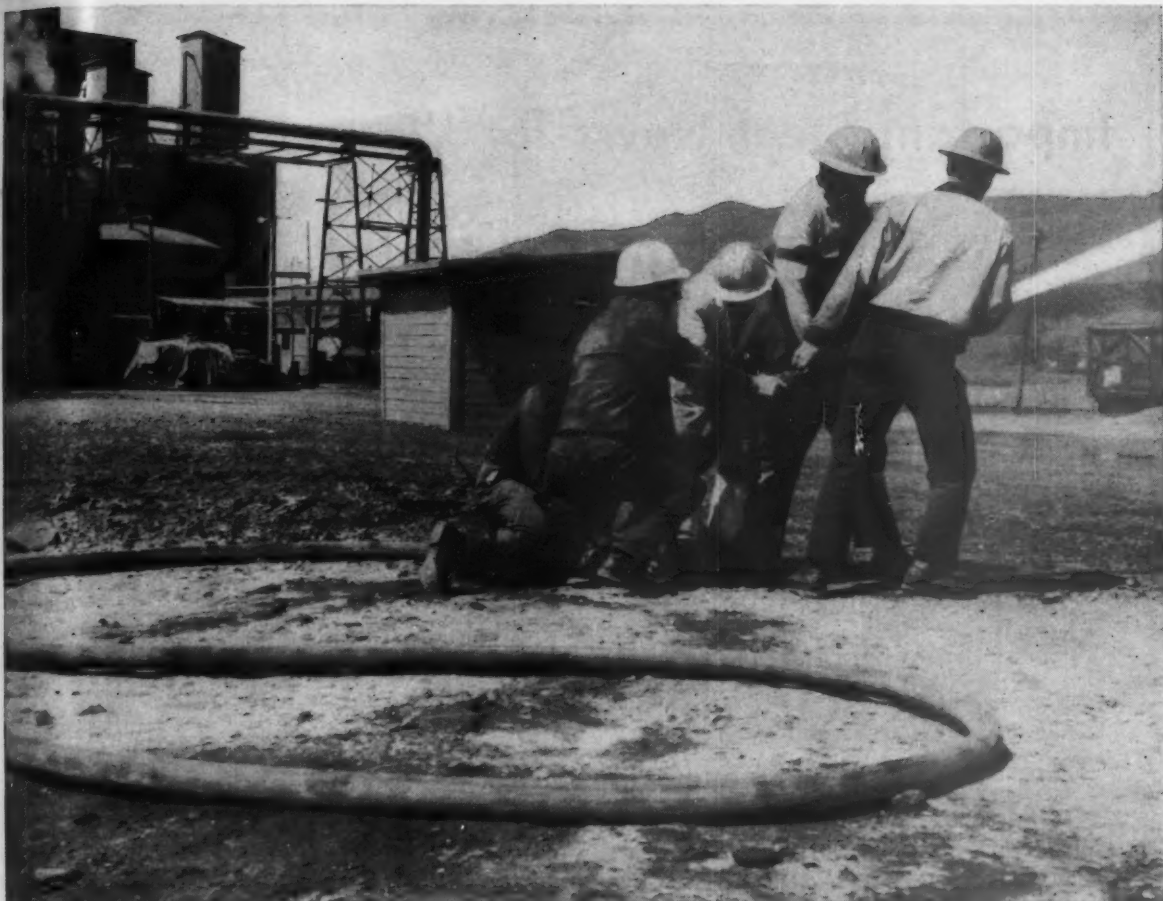
Foresters Discuss Demands on Wood

THE SOCIETY of American Foresters held their 59th Annual Meeting in San Francisco with more than 1000 delegates in attendance. Some 60 technical papers and discussion periods considered the future management needs of the West, which is faced with a rapid population increase. Speakers studied means of meeting the greatly increased demands for wood in industry and housing, and for fiber and forage, and for a continuous supply of water from forest watersheds.

Featured speakers included Charles A. Connaughton, Regional Forester, U. S. Forest Service, and Clarence W. Richen, Manager of Northwest Timber Operations, Crown Zellerbach Corp.

Aluminum Association Appoints Board Member

THE ALUMINUM Association has announced the appointment of Lawrence A. Harvey as a member of that Association's Board of Directors. He will serve in that position until January, 1962. Harvey is chairman of the board of Harvey Aluminum, a primary producer of aluminum, operating reduction facilities in The Dalles, Oregon, and a fabricating mill in Torrance, Calif.



Four-year-old Thermoid-Quaker Petrochem fire hose works under 125 lbs. pressure near Potlatch Forests' caustic operation. Exposure conditions in this area ruined ordinary fire hose in only three months.

"Petrochem" Fire Hose took 4 years of the same abuse that ruined ordinary hose in 3 months!



Mr. C. O. Bing, Fire Chief, shows original test length of Petrochem hose after four years' use.

"Petrochem" fire hose, developed by Thermoid-Quaker, has outlasted ordinary fire hose 16 to one at Potlatch Forests' pulp and paper mill, Lewiston, Idaho. Mr. C. O. Bing, Potlatch Fire Chief, says, "The conditions around our caustic operation are as tough as you'll find anywhere. Just storage in this area ruined ordinary hose in three months. Petrochem hose, without washing or refolding, is still in excellent condition after four years in this rugged atmosphere." Service like this is customary for Thermoid-Quaker Petrochem hose

which is designed for the roughest, toughest treatment imaginable. Neoprene inner tube and neoprene-impregnated "Dacron" jacket give Petrochem corrosion and wear resistance to meet the severest conditions. And Petrochem is available with UL approval.

Ask your Thermoid-Quaker industrial distributor about Petrochem fire hose to meet the severest requirements of the oil and chemical industries. Or write *Thermoid Division, H. K. Porter Company, Inc., 200 Whitehead Road, Trenton 6, New Jersey.*

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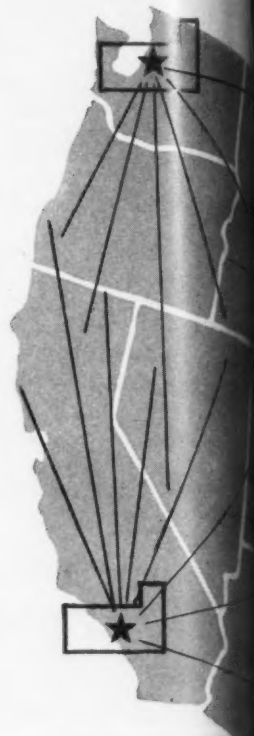
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Important Steel News for Western Industry!

SIERRA DRAWN joins forces with **BLISS & LAUGHLIN**

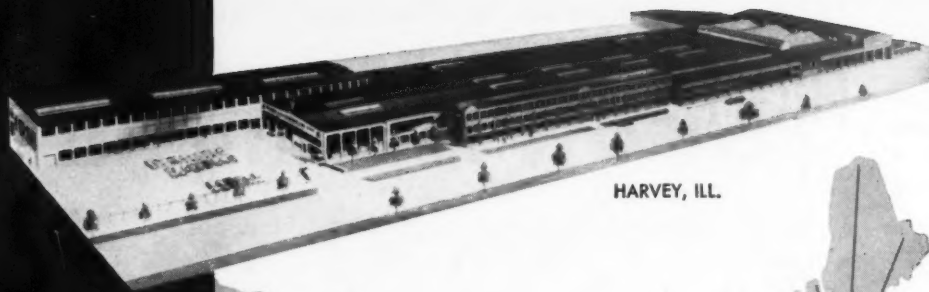
TO BRING TO THE WEST COAST
THE INDUSTRY'S MOST COMPLETE
AND MOST FLEXIBLE MILL SERVICE
IN COLD FINISHED STEEL BARS

Sierra Drawn Steel Corp. and Bliss & Laughlin have joined forces to meet the increasing demands for cold finished steel bars by West Coast industry. As a division of Bliss & Laughlin, Inc., Sierra Drawn supplements its rich West Coast experience with Bliss & Laughlin's nearly 70 years of national experience producing quality cold finished steel bars. This will assure the most complete and most flexible mill service on the West Coast.

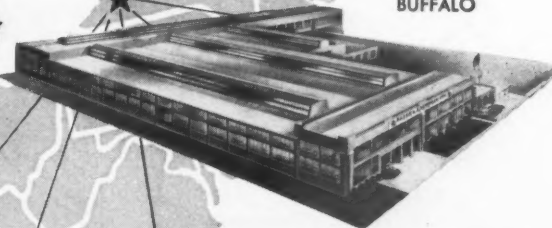
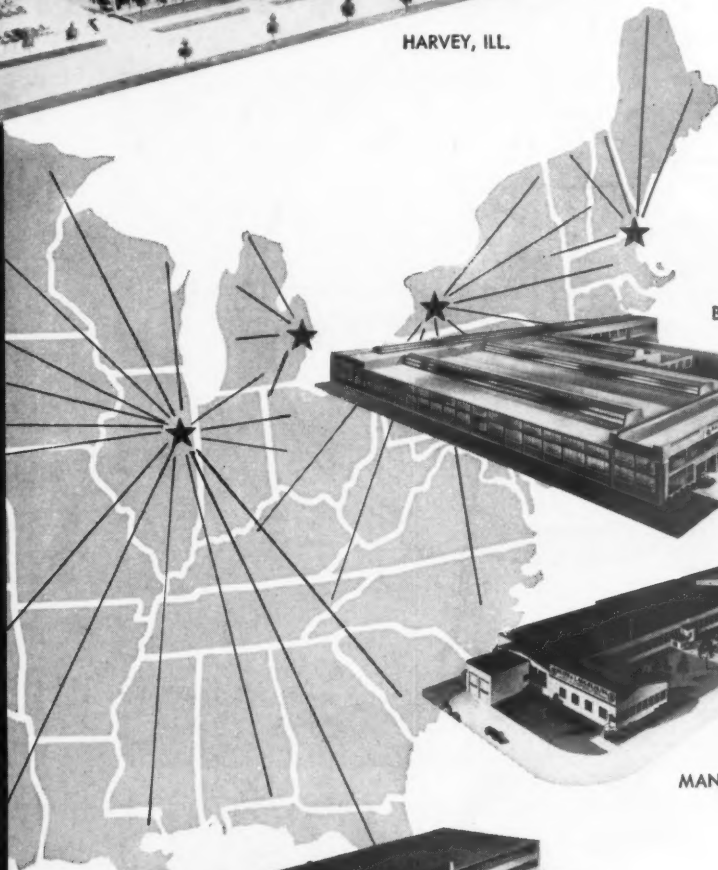


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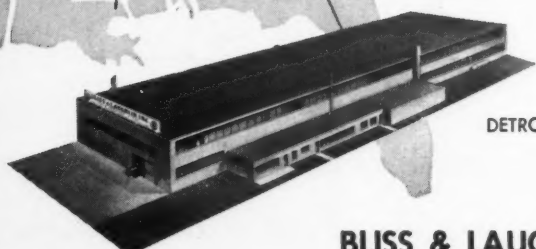
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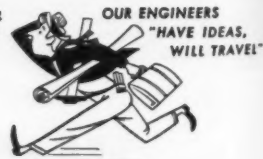
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WESTERN INDUSTRY/MARCH 1960

A REPORT TO MANAGEMENT ON HOW

Industry cuts costs with FIR PLYWOOD

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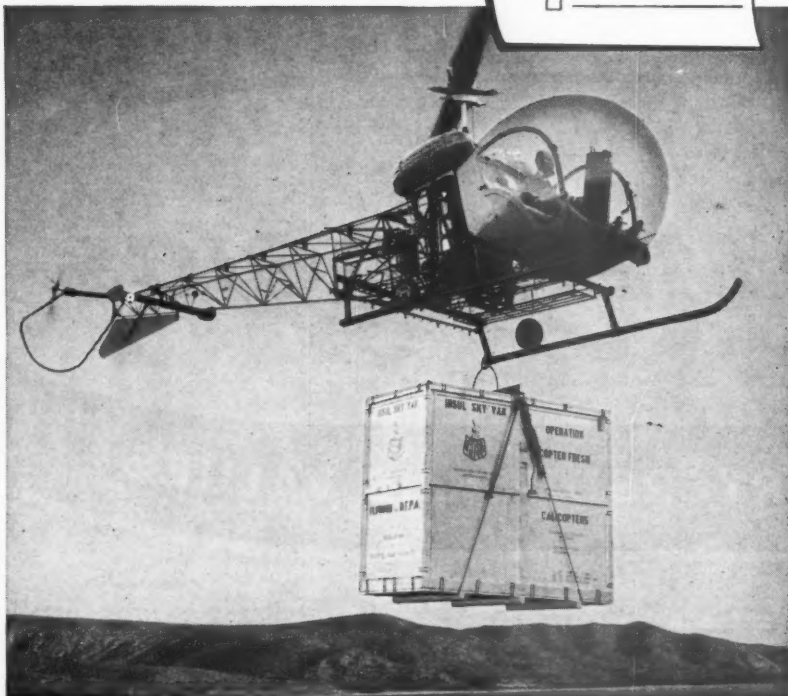
- ☐ ENGINEERING_____
- ☐ PRODUCTION_____
- ☐ SALES_____
- ☐ PURCHASING_____
- ☐ MAINTENANCE_____
- ☐ CONSTRUCTION_____
- ☐ _____

Plywood Sky Vans are the key to a revolutionary new service offered by Calicopters, a California helicopter line offering fast, field-to-market air shipments of prime, highly perishable fruits and vegetables.

Developed by Shield Fabricators, Inc., of Gardena, specialists in design and construction of freight and cargo vans, the new Insul Sky Vans are made of lightweight fir plywood, lined with two inches of foam insulation. Properly sealed, the containers stabilize temperature of pre-cooled contents within 3 degrees for 48 hours.

The standard Sky Van is 84x42x72 inches and carries over a ton of produce in its 113-cubic-foot interior. Assembled with metal Klump fasteners, the boxes can be knocked down and returned flat at minimum cost for re-use.

Plywood construction holds down weight and fabricating costs, and also provides tremendous resistance to racking stresses and impact.



Stronger than steel, lighter and lower in cost, these giant fir plywood box girders were used on the new International Paper Co. converting plant in Auburndale, Fla. Four feet deep and 48 feet long, the girders have one-inch plywood webs with 2x12 lumber flanges and stiffeners. Available in most parts of the country through component fabricators (write for names), plywood beams can be engineered for any load or span and fabricated in almost any shape. Other advantages include ease of handling and smooth, paintable surfaces.



Computer floor system installed at a leading West Coast university employs vinyl-covered 1 1/8" thick plywood over steel supports to provide the strength and stiffness needed to withstand tremendous loads of giant data processing machines. Raised plywood floors for computers permit free cable runs and space for air conditioning. Sections can be removed for servicing or circuit changes.

FOR MORE INFORMATION about fir plywood—its uses, properties and advantages—write
DOUGLAS FIR PLYWOOD ASSOCIATION
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Vol. 25 No. 3

western
industry



RADIO CONTROL for mobile plant equipment

Fewer governmental restrictions, more versatile equipment is making the radio an even more valuable production tool.

RADIO IS A METHOD long used to efficiently dispatch and control movements of mobile equipment sent out into the field. Once virtually restricted to taxis, police and emergency vehicles, today it is common to find the driver of a wide range of industrial delivery and service vehicles communicating with central dispatchers to indicate completion of work and requesting new assignments.

In the West radio is moving indoors to be used for controlling in-plant traffic in larger industrial buildings and warehouses where storage areas are extensive and distant, aisle traffic a problem and face-to-face orders are difficult to give.

For this type of application, low frequency, limited range two-way radio equipment has proved an efficient time and money saver.

At U. S. Steel's Consolidated Western Steel Division, Maywood, Calif., a number of production bottlenecks are being avoided by use of the Kaar Engineering Corp. IMP 325, industrial mobile phone, controlled by a central dispatcher and mounted on fork lifts and other mobile MH equipment.

An added feature of Consolidated's overall communication setup is a series of 11 call boxes linked to the central dispatcher's office. These are used by departmental foremen to report trouble or to request material handling assistance. A word via call box alerts the dispatcher who in turn sends the nearest piece of suitable equipment into the problem area.

Drivers report completion of the assignment and their location in the same manner as outside vehicle operators. The system has allowed better use of equipment during hours of peak activity and aisle traffic has

been reduced.

This not only boosts efficiency but lowers chances of accident or injury.

This new type of limited range equipment has brought with it a lessening of Federal Communications Commission licensing delays and restrictions.



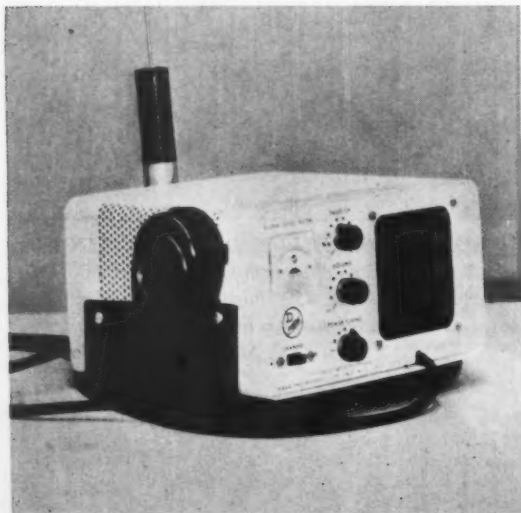
LOCKHEED TRUCK DRIVER CALLS IN to Burbank dispatcher using a Kaar TR 500 series installation in the 450 magacycle class. Unit, with repeater station boost, can reach most of Southland industrial area.



PRODUCTION TROUBLESHOOTERS CALL PROBLEM in, upper right, through call box to central dispatcher at Consolidated Western Steel. Dispatcher, in turn, alerts mobile unit.

Items such as the IMP 325 are allowed wide use by the FCC, can be installed by most business concerns and minimal paper work involved in gaining FCC approval centers around FCC form 400. Also needed is a restricted operating permit. No special skills are

STATIC DESK-TOP INSTALLATION of the TR326 D phone with a universal mobile antenna.



required by those using the equipment, either on the vehicle or from the dispatching point.

Another type of equipment for which FCC restrictions have been virtually eliminated is the Kaar Citizens band class model TR 326 "D" phone that can be used for any business or industrial activity in-plant or for outside communications.

It is limited in range, up to five miles of reliable performance and spotty coverage up to 10 miles depending on terrain. But the phone is inexpensive, lightweight, easily mounted in vehicles and can operate on any one of 23 specific frequencies.

Not all Kaar equipment is relegated to in-plant use. Returning to outside vehicles, Lockheed has equipped a fleet of highway trucks plying between various company divisions in Los Angeles and Orange county with the Kaar TR500A and TR 502 A sets in the 450 megacycle range. These are used to communicate with the central dispatching office at the California Division plant, Burbank, Calif.

An interesting feature is that communications range is boosted via repeater stations such as the Lockheed installation located at Briar Summit, high in the hills overlooking Western Los Angeles. Vehicles can be efficiently contacted as far as San Diego, Calif.

STANDARD EQUIPMENT

handles special applications

Plant furniture and shop equipment are designed for versatility. Standard models can be used for most special applications.

A NEW 109,000 sq. ft. El Monte, Calif., plant has been opened by Hoffman Electronics Corp. and is devoted to advanced research and production of solid state materials electronic devices, among them solar cells that convert sunlight to electricity for applications in computers, data processing units, industrial controls and steel making.

An integral part of the equipment found at the facility, called the Semi-Conductor Center, is a complete installation of shop and office furniture manufactured at the Santa Ana, Calif., plant of Standard Pressed Steel Co., another recent addition to West Coast industry.

About \$50,000 worth of Hallowell shop equipment and Columbia office furniture is installed here.

In an ultra-pure manufacturing environment, that in certain areas of the plant reaches only one-part contaminant to over 500 million parts of air, newly developed production and test equipment is being housed in and operated upon Hallowell standard open work benches, industrial cabinets, and Erectomatic shelving.

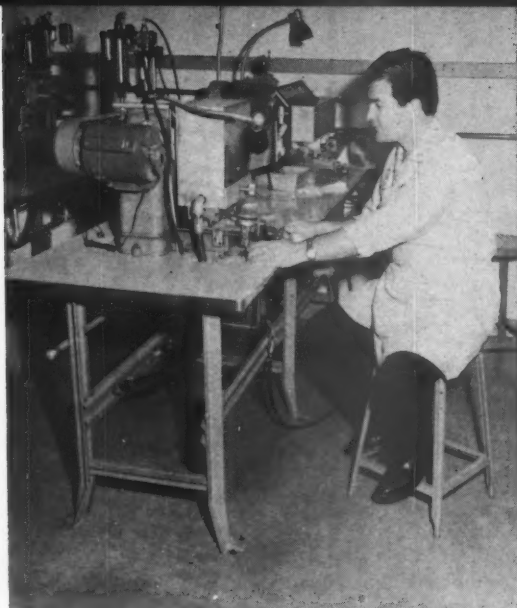
More than half of this sensitive equipment used in R&D, manufacturing and product testing was designed and built by Hoffman engineers.

Production is centered in a 20,400 sq. ft. area that is divided into four major functions. The first site is devoted to specially designed furnaces that grow silicon crystals, the basic element of Hoffman semiconductor devices. This is one of two super clean "white rooms."

The second area is allotted to mechanical processing where grown crystals are slabbled, sliced, lapped, cleaned and prepared for diffusion. This later function, that imparts electrical characteristics to the silicon device, is the second clean room activity.

Final processing puts the product through a series of chemical operations including acid washing, plating, etching, and final checks for electrical characteristics.

In a 19,500 sq. ft. area are found support services



MODEL 600 open bench. Under operation is a slabbing machine that slices silicon ingots into workable units.

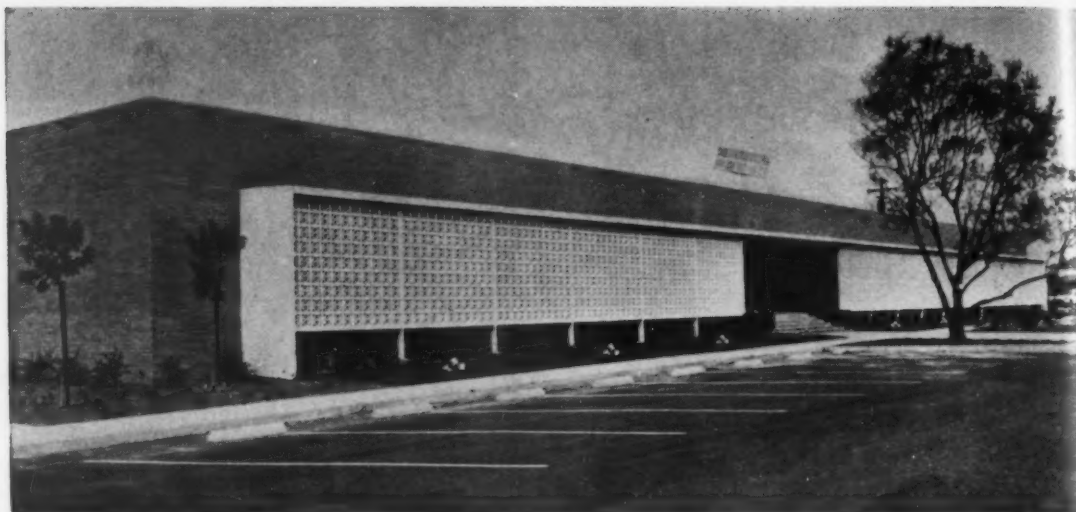
including quality control, the test equipment laboratory, acid storage, and the shipping, receiving and product stock room that uses Erectomatic steel shelving.

The shelves can be changed rapidly without unloading the entire storage section. Beaded front posts and box flanged shelves prevent damage to delicate electronic components and avoid worker injury. The shelving is made from tough, phosphate coated prime steel finished in baked enamel.

Work benches have been installed in the tool room. In production areas to support apparatus for attaching delicate wiring to semi conductor contacts, to support

MODEL 860, counter high storage cabinet used for storage of silicon ingots after coming from ingot furnace.





OVERALL VIEW of new Hoffman Electronics, Inc., El Monte, Calif., plant. Covering 109,000 sq. ft., the plant is devoted to advanced research and production of solid state materials electronic devices.

slabbing machinery that slices silicon crystals into cell thickness suitable for production use, and in the final testing area where operators perform cleaning operations and conduct electrical tests.

Keynote to use of the Hollowell line was the wide choice of models available to adapt to intricate and many sided fabrication steps. Also items could be quickly supplied from the nearby Santa Ana SPS plant.

Work benches are setup either singly, back-to-back, or in continuous lines. They have all-welded steel legs and a variety of interchangeable accessories including shelving, foot rests, and drawers.

Cleanliness requirements are met by smooth, rigid work surfaces of many varieties including heavy gage steel, masonite tempered Presdwood, laminated wood, or heavy duty warpfree "Shoptop," a kiln dried wood bonded with resins under heat and pressure.

Extremes to which cleanliness is stressed can be reflected through employee restrictions, among them use of special clothing, hats, boots in clean room areas. Eating of candy, chewing of gum, smoking, and carrying of personal articles into these areas is not allowed. Most stringent rule for the fair sex in Hoffman clean rooms rules out use of face powder.

OFFICE DESK used in plant by office personnel.



ERECTOMATIC SHELVING in the shipping, receiving dept.



CUTTING BY CANNON

high speed machining process

Super velocity metal cutting process uses 20-MM cannon to fire a cut into fully hardened high strength metals.

A SUPER VELOCITY metal cutting process having a kinship with explosive forming techniques is employing a 20-MM cannon to literally fire a cut into fully hardened high strength metals including AISI 4340, AM 350, Inconel "X," 6A1-4V Titanium and 7075-T-6 aluminum.

Machining velocities of up to 250,000 sfpm have been successfully reached in this program conducted by Lockheed Aircraft Corp., Burbank, Calif. According to J. B. Wassall, director of engineering, this speed

is 16 times faster than cutting speeds now used for aluminum and more than 6000 times faster than those associated with hardened steel and Titanium.

Using a modified 20MM gun, engineers fire a workpiece-projectile past a tool affixed to a special extension in the barrel. The workpiece-projectile, varying from 1¾ to 12-in. in length, is propelled by a standard 20MM hand-loaded cartridge.

By varying both powder charge and projectile weight, cutting speeds can be regulated between 15,000 to 250,000 sfpm.

After the cutting operation, the unmarred workpiece is trapped in a bunker filled with Celotex sheets.

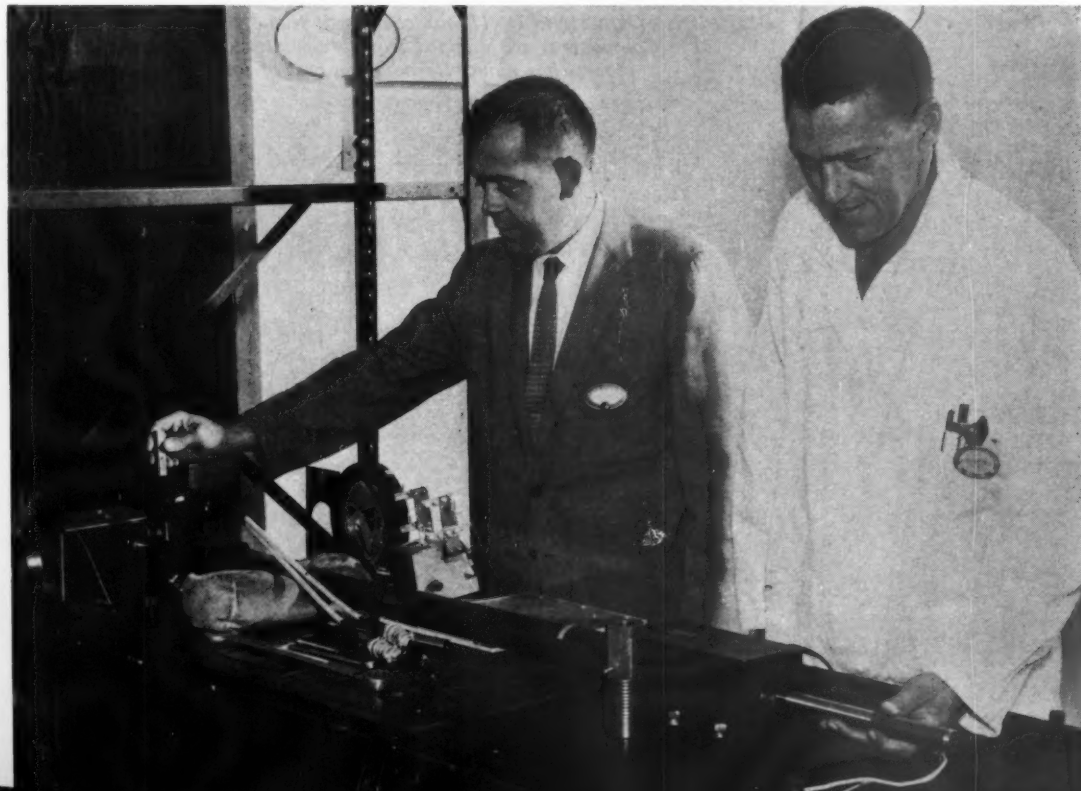
Cutting tools used are ¾ and ½-in.-square configurations made from convention high-speed tool steel. Used only once, the tool is carefully checked to establish a direct comparison between wear, cutting speed, and metallurgical change.

Tooling is held in both a rigid holder, to give inflexible support, and in other tests a instrumented holder to record horizontal and vertical cutting forces. Tests showed that 120,000 sfpm was the best machining speed for minimum tool wear on AISI 4340 steel. No upper limit was established for machining speeds.

Results of this test program show a number of advantages. These may lie in improved surface finishes, increased tool life, handling of any hardness of metal, and lower temperatures at the tool face.

Before Lockheed's investigation of high-speed machining, it was believed by many fabricators that metals possessed critical impact velocities and would fail if these were exceeded. Laboratory and field tests, however, have indicated that machining speeds could be greatly accelerated without harming metals.

WORKING AT BOTH ENDS of the specially rigged 20-MM gun, engineer Robt. L. Vaughn inserts cutting tool as technician, right, readies projectile-workpiece. Note 20-MM shell backing up cylindrical workpiece.



METAL COATINGS

cut production costs

Pre-painted and coated metal can save money on the production line. Here is what happened to one firm.

A NEW PRODUCTION TECHNIQUE just beginning to be utilized is the use of pre-painted and pre-coated metal sheet for manufacturing parts. Developments in paint and coating techniques are providing surfaces that are not only chip and flake proof, but are resistant to scuff marks, even when subject to the type of stresses and deformation caused by presses and press brakes.

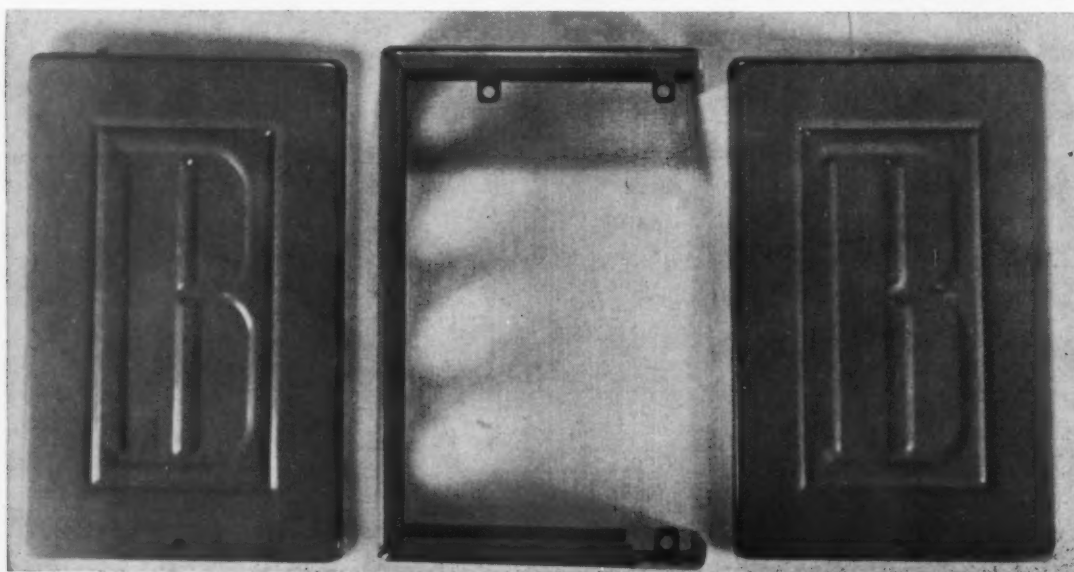
Berkeley Division, Beckman Instruments, Inc. in Richmond, California is using aluminum sheet, pre-painted on both sides, to make the frame and covers

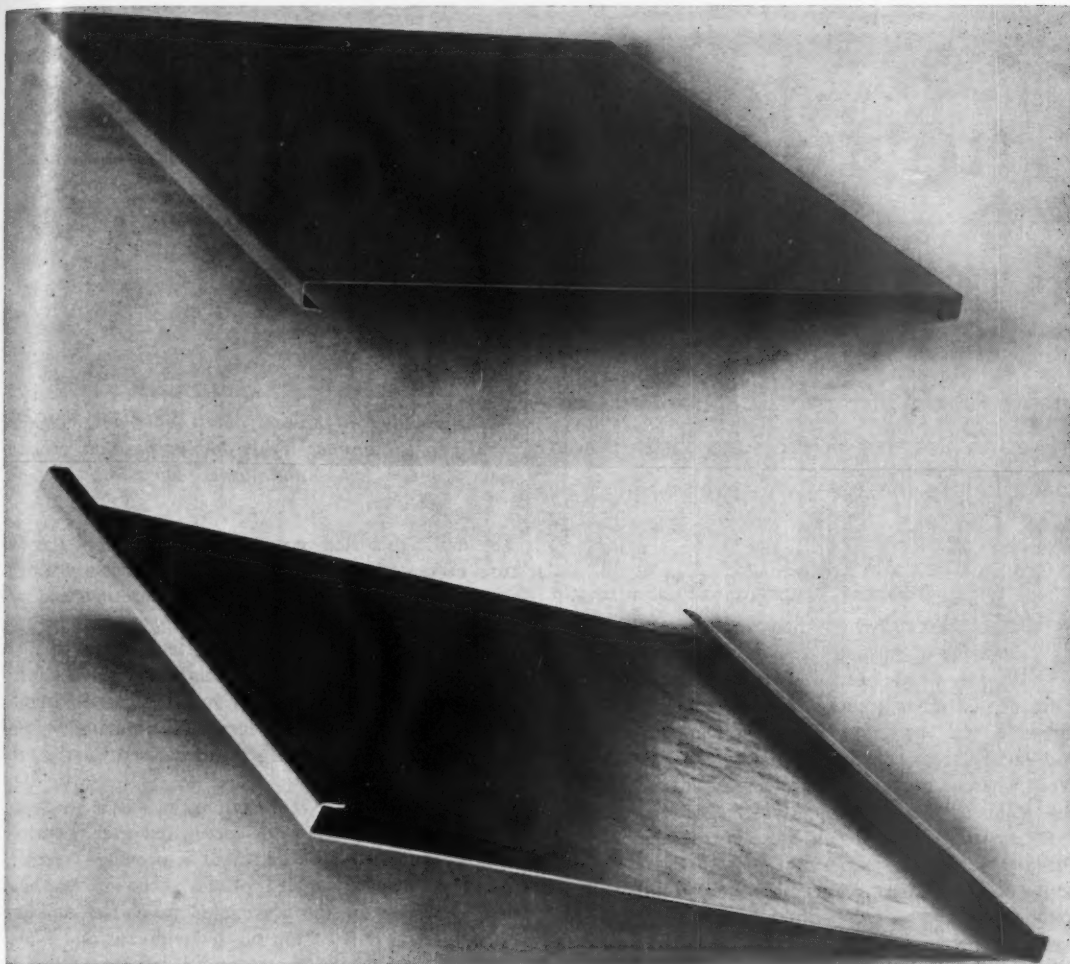
of its Decimal Coating Units, found in almost 90% of the high speed counters manufactured by Beckman's Berkeley Division. The pre-painted aluminum strip supplied in rolls by Bridgeport Brass Co. is stamped, pierced, and formed into a finished part. The part's finish does not flake, is chip proof, and shows no scuff marks. This method has eliminated a number of operations over the previous method, cut fabrication time in half and reduced the actual production cost of the complete Decimal Counting Unit (one frame and two covers) some 600% over the previous method.

In the fabrication of Decimal Counting Unit frames and covers, Beckman uses two types of pre-painted aluminum strip. The covers are made from 6011-0 aluminum, .022 in. thick by 3.869 in. wide. Frames are stamped out of 5005H34 aluminum, .057 in. thick and 1.609 in. wide. Both parts are pre-painted with gray license plate enamel. From four to eight decimal counting units are found in most of the high speed counters produced by Beckman. They are also sold as separate units for replacement nodules. Production on decimal counting units is close to 50,000 per year. This means a production of 50,000 frames and 100,000 covers or 150,000 total parts per year.

The company uses a 40-ton Federal press to stamp and form both parts. Their 25-ton Rousselle press also is suitable when production requirements call for a second press. Frames are stamped out with two dies, one of them used a two station die. From the coil stock, the first stage blanks and pierces; the second stage forms; and a second die bends two 45 degree angles. A three stage die is presently being considered for this operation. Two cover dies are used. From coil, the first die blanks and pierces, and the second die forms. Parts are positioned on the second die by means of a vacuum suction arm.

DECIMAL COUNTING UNIT box consists of frame (center) and two covers. Components are stamped from pre-painted aluminum strip and the process has reduced production cost of unit 600% over old way.





TWO VIEWS OF COVER PANEL used as top and bottom cover panels on all firm's standard test instruments. Panel will be formed from special sheet of 22 gauge steel, galvanized on inside and vinyl coated on outside. A savings of 50% is expected.

The use of pre-painted stock has resulted in some unexpected savings in the press room. It was found that no forming lubricant was needed, as the stock itself acted as a lubricant. As a result, a parts washing operation was eliminated. On the dies, die wear has been negligible and die maintenance, mainly the replacement of small pins, has been eliminated—a savings of some \$35.00 per month.

Pre-painted stock has saved 30 man hours a week in the paint shop. The previous method included washing, conversion coating, drying, and painting in groups of 50 face up, inspection and repainting of rejects. To perform these operations required several handlings to transfer parts on the racks. All of this has been eliminated.

Beckman Instruments in figuring production costs adds 25% overhead to its labor costs. Figuring the net overall material and labor savings per year on fabrication of both the frame and cover, the company has saved \$10,250.

This has proved so successful that Beckman is in

the process of starting to use the same method to make the top and bottom covers (which are identical) for all of its standard test instruments. After working with Columbia-Geneva Division, U. S. Steel, they have developed a special sheet of 22 gage steel, galvanized on one side and clad with .006 in. vinyl on the other. A 17 in. by 17½ in. blank of this sheet can be bent into a "U" on both ends with a rocker die on a brake press without marring or damaging the coating in any way. A savings of 50% over the previous method is expected.

The company has been working on this problem for some time. Instrument covers were formerly fabricated from 14 gage aluminum. To reduce costs, 20 gage steel was then tried, and now they have gone to 22 gage steel. One of the problems of pre-clad steel was that the other side required a protective coating. This could be done, but when the metal was sheared, unprotected edges were left. This was solved by galvanizing the side not clad. Sheared edges are protected by the galvanic action of the coating.

PLANT EXPANSION

needs careful planning

In the future, plant will be doubled and tripled in size. It's all provided for in plans made before the plant was ever built.

A PLANT EXPANSION that requires extensive remodeling of existing facilities can be very costly. Pre-planning is needed and here is an area where a far-sighted management, one that plans well ahead for the future, can save a considerable amount of time and money. Nowhere is this more true than in the West, where companies are growing rapidly and many new plants are being built and older ones expanded.

Efficient plant expansion must be pre-planned far ahead. One such example is Superior Alloys Co. in South San Francisco, a medium, small stainless steel foundry, producing corrosion and heat resistant castings. The firm, a new subsidiary of Superior Electrocast Foundry Co., recently built a foundry and began production. Superior's Chief Engineer, Don Mason, in his basic planning made provision for a plant three times the size of the plant that was built. Meticulous planning of even the smallest details was made ahead of time. Every piece of equipment that will be bought in the future is spotted as to location and facilities provided for it. The result is a new plant that not only functions efficiently in its present form, but can be expanded with an absolute minimum of cost, and in two stages, to a much larger plant, automated and modern in every respect.

The new plant has a Lectromelt electric arc furnace. However, in the second expansion stage, an induction furnace will be installed. Since this would require additional power, a central electrical sub-station, larger than necessary for the existing furnace was installed. Heavier wiring was also installed to handle future additional power loads. The induction furnace will require generators, so space was allotted in the arc furnace transfer room for these generators, and the exact space for a control panel roughed out on the wall. A steel plate now covers where the future control panel will go.

Additional gas will be required for future operations and a large gas line was installed with this in mind. A liquid oxygen supply tank and its pipe line were also installed large enough to handle future requirements.



FRONT of present plant. Note dust collector unit at right, present position of door and plastic panels to let in light.

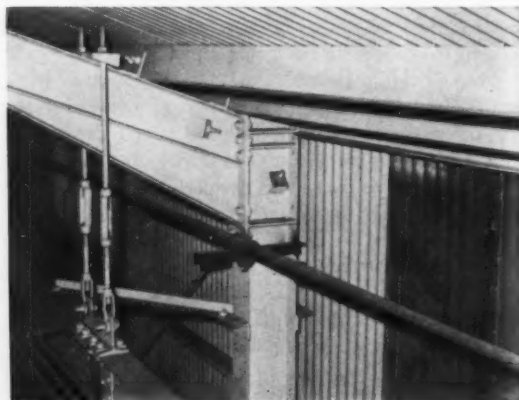
The drainage system covers the total area of the future expanded plant, providing the necessary storm drains and sumps. It was done all at one time and under the most suitable conditions.

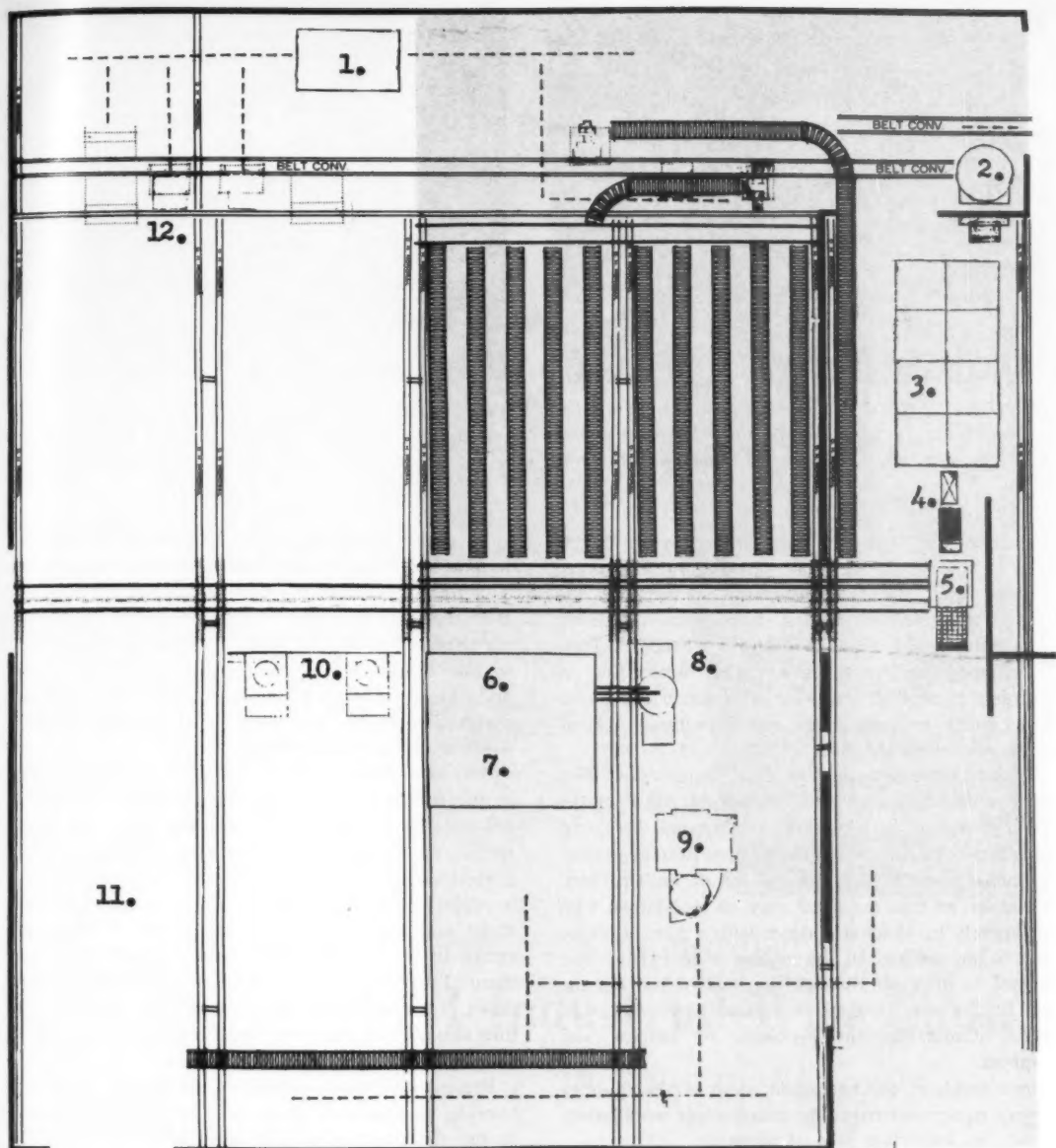
Though the law is not yet in effect, in anticipation of future need, a smog control unit has been installed. The unit is a Sly dry bag type dust collector that takes the smoke from the furnace and arc welding operations. A Metal & Thermit rectifier is used for the arc-air cutting section.

Building design is quite interesting. It is made of bolted structural steel with corrugated iron covering. There are no windows and light is provided by electricity and by corrugated plastic sheets used where needed instead of the corrugated iron. The building is an integral part of the plant equipment and is designed around the casting process. It holds up the sand handling system for instance, and no additional support is required for the various items of equipment.

The present plant, constructed by San Jose Steel, is rectangular, 40 ft. across by 110 ft. deep. Plans are to add two additions of a similar size to this basic unit. The concrete footing on the left side of the building have been made heavy enough to provide support for

STRUCTURAL STEEL column on left side of building that will be used for plant addition. Note 4 holes already punched ready for bolting.





LEGEND

- | | | | |
|-----------------|------------------------------------|---------------------------------|--------------------------|
| 1. core oven | 4. elevator & screen | 7. arc furnace transformer room | 10. induction furnaces |
| 2. mixer | 5. shake out | 8. arc furnace | 11. shipping & receiving |
| 3. sand storage | 6. induction generators & switches | 9. wheelabrator | 12. core blow |

PLAN OF Superior Alloy foundry after first stage of expansion has doubled interior plant size and increased facilities. Present size is indicated by color tint block. Before present plant was built these plans were complete. A second stage of expansion, not shown in drawing, was planned to triple size.

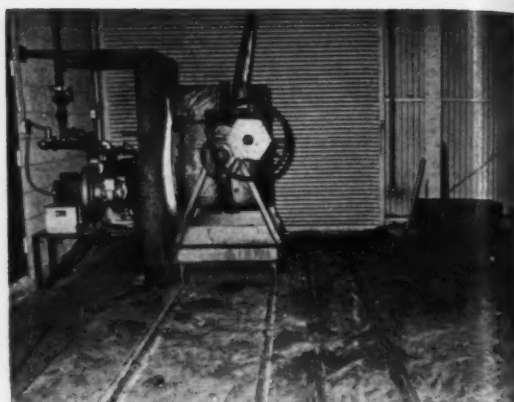
the second addition. All structural steel columns on the left side have holes already punched and ready to bolt on trusses for the next bay. The present receiving door, 24 ft. wide, must be changed when the building is expanded. The complete door can be taken out and re-installed in a new location designed for this very door.

The concrete floor is constructed 6 in. thick and re-

inforced with steel. In the future, complete sand reclaiming equipment will be installed in the present building, though this not needed at present. The equipment will require two pits, one for the shake-out machine and one for the screening equipment. When the floor was poured, provision was made for these pits, so that the expense of tearing up a reinforced concrete floor would not be necessary.



FOUNDRY SAND in wheelbarrow is being moved to hopper (grating in foreground), where it will be dumped. Conveyor will replace this method.



TRANSFER CAR operates on narrow gauge rails. These can be extended in straight line at time of plant expansion.

The concrete floor in the cleaning room is a double floor. It consists of the 6 in. sub-floor of reinforced concrete. Over this a bond separator has been laid and 3 in. of concrete then poured. Experience has shown that eventually the cleaning room floor becomes pitted and chipped, and must be replaced. When this replacement is needed, the 3 in. of concrete can be removed easily and new floor poured without disturbing the reinforced sub-floor.

A separate building is now being constructed, as a locker room and wash room for the foundry. Facilities are large enough to take care of additional personnel that might be needed when the plant is fully expanded. The locker room lockers are situated on built up concrete slabs, so that the floor may be maintained with ease, merely by sluicing it down with a hose. Lockers reach to the ceiling. In the ceiling is an exhaust fan designed to draw air through the lockers and out the roof. In this way, lockers will receive constant ventilation, eliminating the problems of mildew and dampness.

Since much of the equipment used in the foundry is heavy equipment requiring considerable installation, this was an important area of planning.

CORE ROOM, note hoppers in background fed sand from mezzanine. Roller conveyors are for molds ready for pouring.



A crane system using Yale 2-ton hoists who designed so that it would fit perfectly into future expansions. The present system runs lengthwise down the building, from the furnace to the mold room. Two parallel cranes are used. They are set up with a system of interlocks so that a hoist may transfer over to the other crane and run on its track. Future additions to the plant are designed to extend this interlock system the complete width of the expanded plant.

The sand mixing system has been planned so that in the future, it cannot only be extended with ease, but can also be automated. Sand mixing is done at the rear of the foundry on a mezzanine. Sand is stored in a shed outside of, but a part of the foundry. It is brought to the mezzanine by a skip elevator. Refractories and bonding material are moved to the mezzanine by a Mathews endless belt conveyor and stored there. The conveyor can move material either up or down. The mezzanine in expectation of increased future storage requirements, has been designed to hold a much heavier load than is there now.

Present operations consist of mixing the sand and bonding material in a Simpson Intensive Mixer located in the right corner of the mezzanine, dumping the mixed sand into a wheelbarrow, rolling it in a straight line to one of several hoppers located over the mold filling stations below. These hoppers are kept filled as needed by dumping the sand from above.

Future plans will allow for expansion of the mezzanine and hoppers in a straight line for ease of operation. They also make it easy to install an automatic belt conveyor system from the mixer to the various hoppers. Such a system is not only planned, but can be installed at a reasonable cost whenever needed and can be expanded inexpensively by merely extending it in a straight line.

In the foundry, molds, ready for pouring, are located on roller conveyors. They are poured and rolled to a transfer car which conveys them to mold shake-out. Another roller car moves the width of the foundry on rails, similar to a narrow gauge railway. These tracks have been located so that they may be extended in a straight line for future expansion, with little if any trouble.



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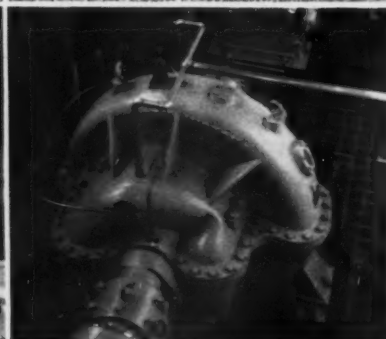
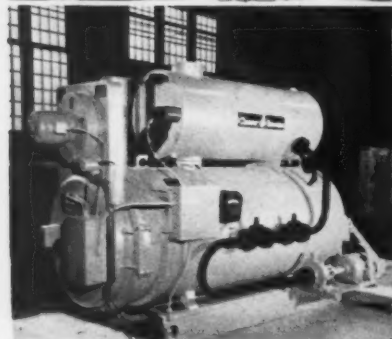
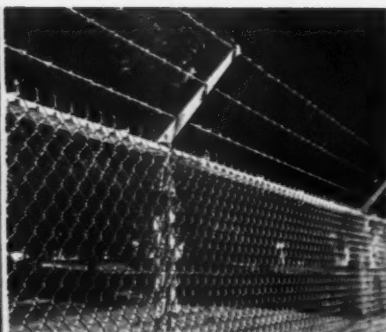
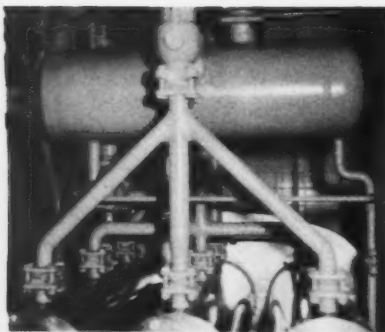
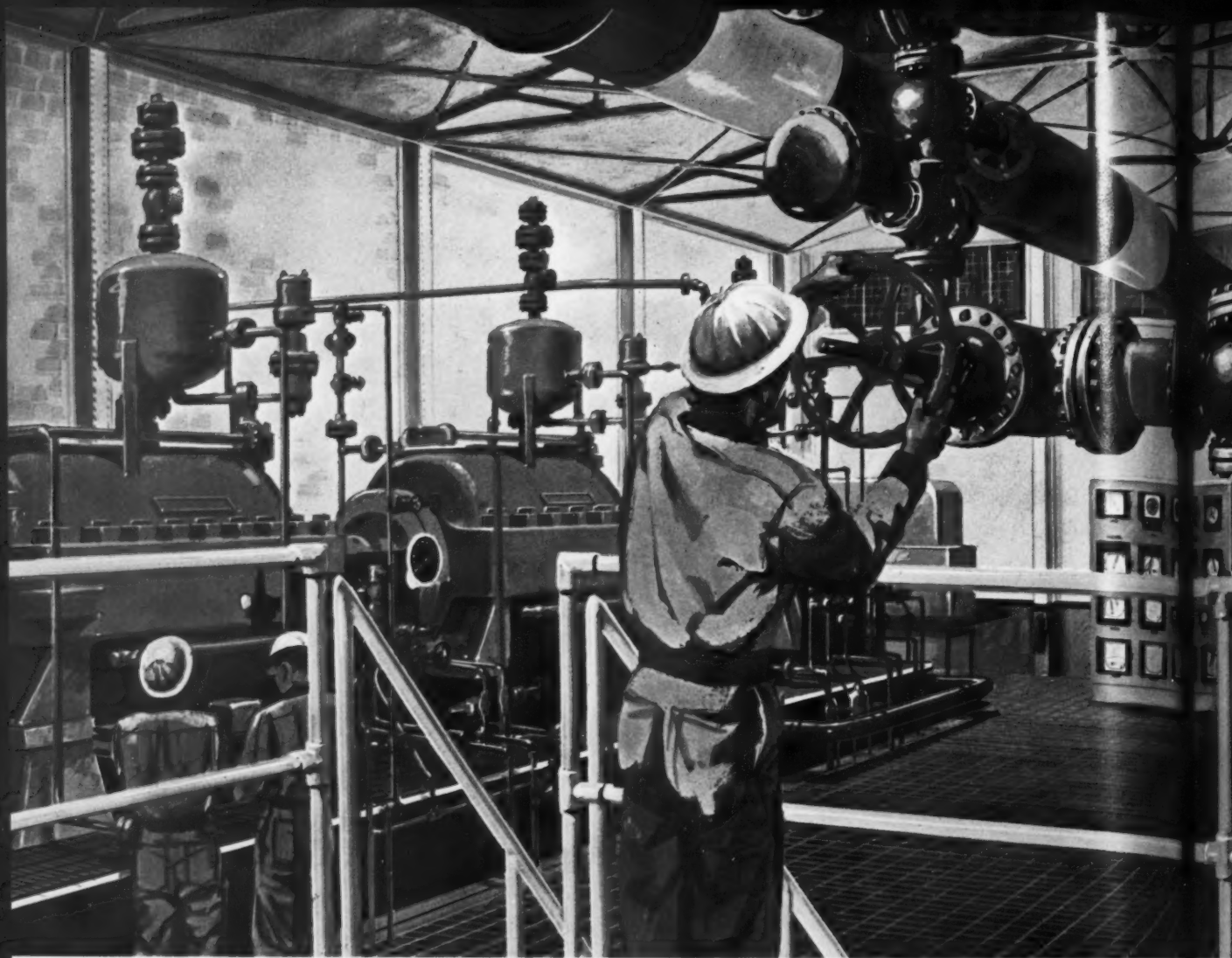
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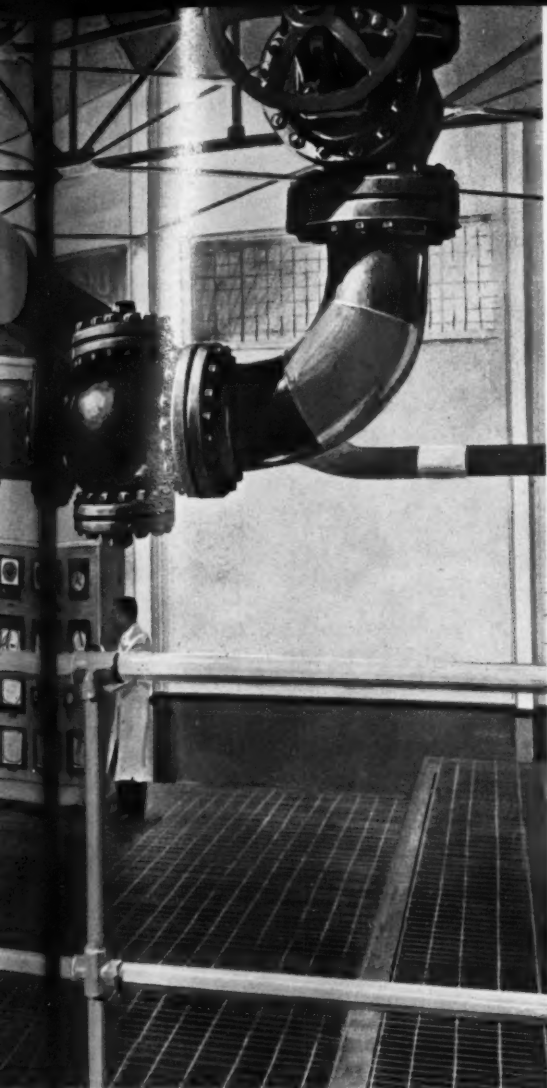
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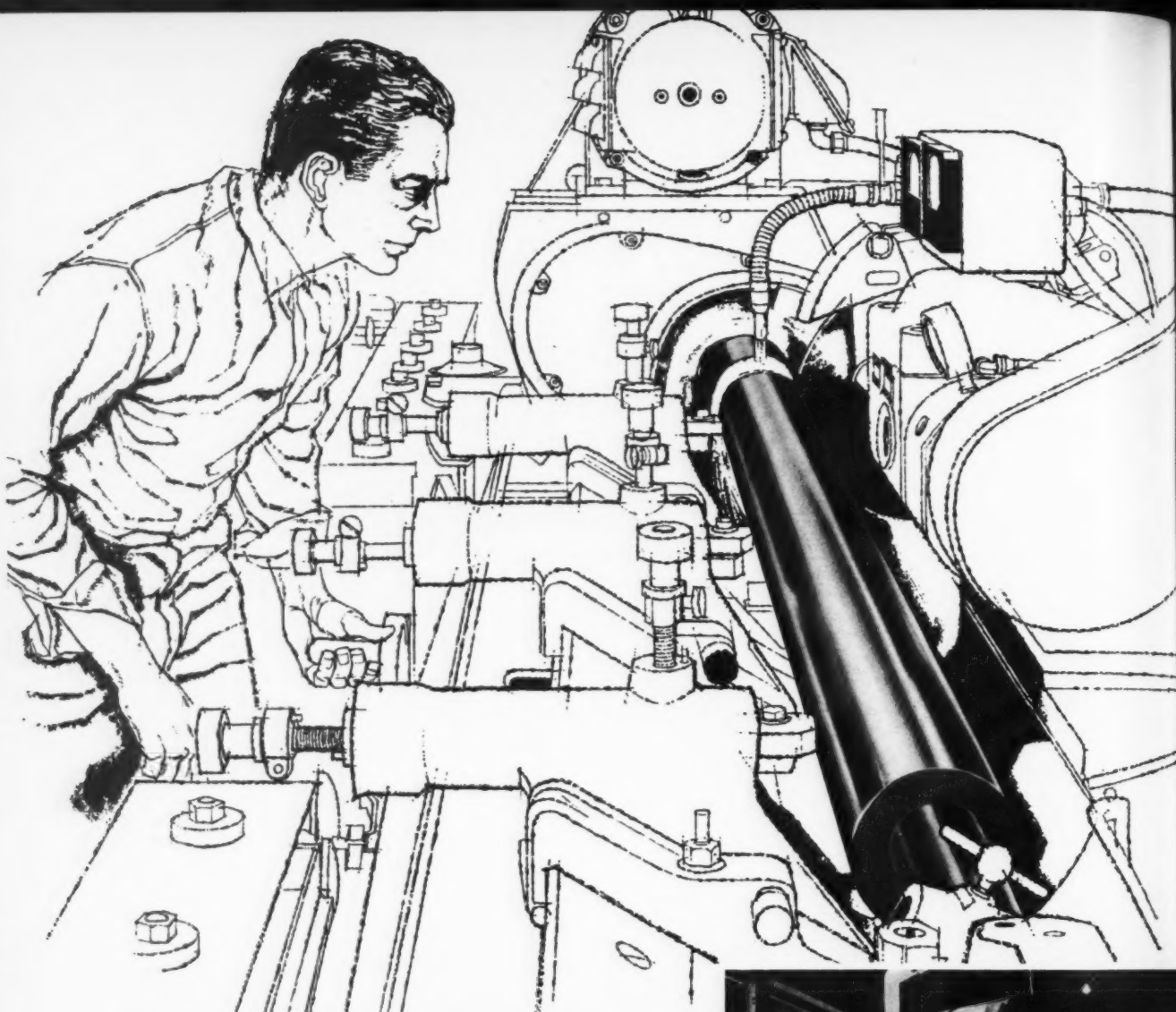


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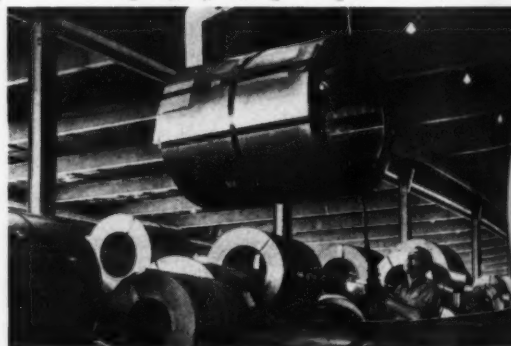
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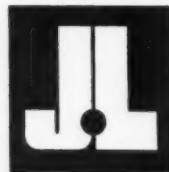
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CLEANING PROCESS

for close tolerance parts

Here is a method of cleaning those hard-to-reach areas of close tolerance metal parts after the part has been machined.

A POST MACHINING CLEANUP process that rapidly flushes oil, dirt, chips and other foreign matter from close tolerance metal components is being developed by engineers at Garrett Corp., AiResearch Industrial Div., Inglewood, Calif.

Key to the current system is a heated detergent and a rust resistant compound that is blended into a single cleaning agent and forced by compressed air into areas of machined components that would be inaccessible to hand-operated cleaning tools.

The operation is being used to clean oil channels drilled through diesel engine turbocharger components. Since rotating parts in some turbocharger models operate at speeds as high as 80,000 rpm, slightest traces of rust or foreign matter in the lubrication channels could be damaging.

Cleaning operations center around a large sink-like stainless steel fixture equipped with three 30-gallon tanks.

These are filled with the solution that is kept at a 160° F. to promote cleaning. The part is immersed and each oil channel gets an 8-minute cleaning.

The operator takes a compressed air hose, fitted with a copper nozzle sized to fit the oil channel, and blows the dual-purpose compound through the channel. Air agitated detergent effectively washes out oil and removes all impurities. The tank is fitted with a series of hoses to allow a number of turbochargers to be cleaned at once.

Following the cleaning, each part is dried and then sealed in pliofilm bags until needed by the assembly department.

Currently under development is a modification of this system that will be able to handle cleaning of a higher production flow of turbocharger units.



OPERATOR INSERTS copper nozzle into oil channel of turbocharger part. Note agitation of cleaning compound in first two tanks.

AFTER INSERTION OF NOZZLE the part is immersed for 8-minute cleaning cycle. Cleaning agent is heated to 160° F.



TELETYPE MACHINES speed freight bill processing

Allows one day billing service for truck freight bills

USE OF FOUR leased-wire teletype machines to process freight bills at Delta Lines Inc., Emeryville, Calif., has resulted in greater efficiency and economy of operation in the Los Angeles terminal of this intrastate motor carrier.

Teletype permits Delta to process paper work on a shipment picked up in Los Angeles so rapidly that it can be sent to the San Francisco terminal in time for it to accompany the shipment to its destination in Northern California.

Delta's regular service enables a shipper calling for a pick-up in Los Angeles prior to 3 p.m. to have delivery in the northern part of the state by the following day.

This short time delivery cycle made speed-up of freight bill processing necessary. The new system has increased accuracy and eliminated costly mistakes in paper work.

The Los Angeles office is equipped with two sending machines and two monitors. One monitor is a



ONE DAY BILLING service for northbound California shipment. Billing is processed by teletype from L. A. to San Francisco in time to accompany shipment to destination.

pre-perforating unit that cuts the teletype tape by electrical rather than manual means.

NEW PROCESS from copper scrap to strip

Practical method developed for copper scrap recovery

THE FLUOR CORP. Ltd., Los Angeles, Calif. has developed what they claim is the first economically practical method conceived for the recovery of copper powder from scrap that is transformed into copper strip, all in one smoothly flowing operation.

This is the process in a nutshell. Copper scrap is leached by an ammonium carbonate solution in a controlled erosion process that selectively dissolves copper from extraneous material.

The copper containing solution is then fed into an autoclave where heat, pressure and a hydrogen atmosphere precipitate copper powder from the slurry.

Contaminants are washed away and the powder is dried and readied for sale to the powder metallurgy industry or for conversion to copper strip.

Until Fluor came up with this improved process, copper powder was costly and its use was restricted to small powdered metal parts, to paint pigments and friction materials.

Initial production of the copper powder from scrap was undertaken on a semi-commercial basis by Whitaker Metals Corp. This was the first firm to try the Chemetals process although Sherritt Gordon Mines, Ltd. was using its own version of the technique to produce nickel powder from ore.

Fluor was retained by Whitaker Metals to iron out

serious operating difficulties, and took over plant operations to insure ultimate commercialization.

The immediate goal was to modify operations so that a powder product acceptable to the powder metallurgy industry could be routinely produced. Operating costs has to be trimmed if the product was to be pulled within a competitive price range.

A pilot plant operation was set up at Whitaker Metals in Kansas City, Mo., and at Fluor's Whittier, Calif. research facility. This operation led to significant cost cutting, one example of this involving a chemical additive that boosted once-through metal recovery in the autoclave from less than 80% to practically 100%.

It was found that an installation designed to produce 50-tons of powder a day was the minimum size to achieve operational economy.

Next came development of a powder to strip process. This is accomplished by compacting the powder continuously through a pair of rolls. This is followed by sintering to closely bond particles and then by a final rolling which produces the fully dense strip.

Developed by the E. W. Bliss Co., from a German process, the new strip rolling technique was tailor made to fit the extractive operation.

ADJUSTABLE RACKS

for storage flexibility

Rapid shelf changes using adjustable storage racks cause increased flexibility in operations.

USE OF ADJUSTABLE storage racks has allowed Youngs Market Co. to increase flexibility of operations in their Los Angeles warehouse ranging from handling of daily bulk shipments of 5000 cases of merchandise to processing of hand-picked special orders involving a few cartons at a time in a "ready" storage area.

Young's system hinges upon handling of large quantities of fast moving items on pallets and slow moving goods on adjustable Sturdi-Built storage racks made by Union Asbestos and Rubber Co.

The 116,000 sq. ft. warehouse, for example, handles about two railcars of cased liquor and spirits daily. If the shipment is considered a fast moving one it is processed for pallet-load reshipment and floor stacked.

Slower moving goods, many of them in cartons and broken case lots, are stored in Sturdi-Bilt racking assembled in three and four-high tiers.

Racks consist of three basic parts; a floating wedge lock fastener to join rack components, an upright frame, and support bars. The upright members consist of vertical channels that are cross braced horizontally and diagonally to withstand loading and unloading stress. Slots for the wedge locking device are located on 3-in. centers.

The support bars form a framework for shelving on which the pallet itself rests. Assembly can be accomplished by unskilled labor and company spokesmen estimate that two support bars can be installed in 3 to 4 minutes.

This permits rapid change in shelf height to accommodate a new-sized package, and readjustment of shelving need not interrupt normal warehouse timetables.

A string of five racks at a time can be relocated rapidly by two fork trucks.

Full pallet loads of food and spirits are moved from the reserve storage area on gravity roller conveyors to the "ready" area from which small orders are filled. These shelves are refilled from the reserve area as soon as they are depleted.



VIEW OF THE "READY" area shows clerk hand-picking full cases and cartons from broken case lots. Top center shows cartons from broken case lots for repacking small items.

Case loads are repalletized for truck shipment or repacked. If merchandise is picked from the rack in broken case lots, it is sent to a special re-packing operation prior to dispatch.

Young's warehouse is serviced by an order-taking system that allows outside salesmen to phone orders directly to the warehouse. The order is accepted and written out on a special form that is sent to a tabulating room.

Here it is processed via IBM Ramac computer that produces a six-part order form. Three copies are used to service the customer, one serving as a signed delivery receipt. One copy is used by the "ready" area for shipping cased orders and another goes to the repack area for shipping broken case merchandise. A final copy is retained for a sales record.

VACUUM BAR lifts curved panels

Difficult engineering problem of vacuum holding contour surfaces

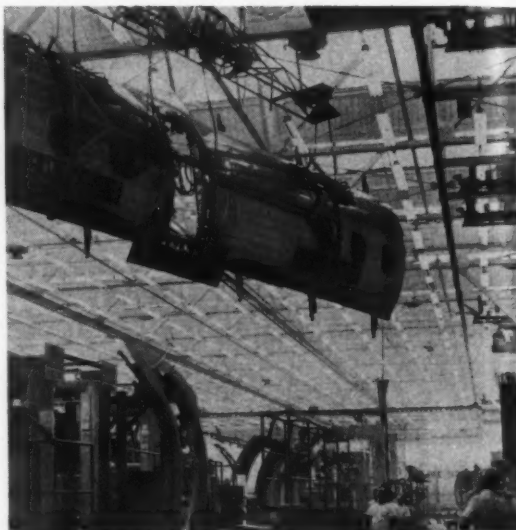
TIME AND labor costs involved in movement of large, curved fuselage panels up to 35-ft. long, 8-ft. wide, and weighing up to 1200 lbs., have been reduced by use of a vacuum-pad lift bar built by Lockheed Aircraft Corp., Burbank, Calif., for use in Electra transport fabrication.

The device is used in moving the huge aft fuselage panels from an assembly jig to the bed of a General Drivmatic Riveter. Major problem in designing the lift was in making sure it would hold the panel rigidly, avoiding whip and bend that would warp the assembly out of tolerance and prevent accurate positioning in the automated riveter.

Vacuum cups have long been used by firms handling assemblies with flat, easy to connect surfaces but Lockheed's successful effort, perhaps the first in the airframe industry, is able to move items with extreme contours.

The new rig has resulted in further savings by eliminating cost of making automatic riveter bars that were bolted to the fuselage panels to serve both as a support tool to prevent bending and as a lifting aid.

The vacuum lift has a structural framework shaped in a capital "I" that is turned on its side when in use. A bank of four vacuum pads, two to aside, grip top and bottom sections of the panel securely.



VACUUM LIFT apparatus hoists aft panel from jig, lower left, and moves it to riveter. Note how lift can handle weight of tooling fixed to door frame and structural members of panel.

GEAR BOX has multiple speeds on two shafts

Special gear box provides flexibility in power transmission

A SPECIALLY DESIGNED gear box has recently been delivered to Rocketdyne, a division of North American Aviation, which is being used at the firms' Canoga Park test facility.

The gear box, designed and manufactured by Western Gear Corp., Precision Products Division, resulted from demands by Rocketdyne for a unit capable of multiple speeds on two output shafts, with quick gear shifts between speeds, and a neutral on each output shaft.

For this application—planned for use in testing rocket engine components—Western Gear designed and manufactured a 4,000-hp. high speed gear unit, using precision double helical gear elements. The gear

unit was designed with a single input shaft and two output shafts.

Each output shaft has two speeds, 6,300 or 10,000 rpm., and a neutral position. The gear box also features a specially designed gear shift for fast changes, while eliminating possible damage to gears during shifting since they are never pushed in or out of mesh.

Advantages of the gear which was designed to meet exacting test requirements are fast speed changes . . . dual test setups and neutrals on output shafts allow one shaft to be stopped while the other is running.

Result—valuable test runs can be made in less time at lower cost.

NEW MILLING PROCESS

electrical discharge machine

New process of spark machining is used on hard steel alloys, piercing metal parts too small to drill, forming and tool sharpening. Device is highly accurate.

FOR MACHINING of hard steel alloys and piercing of metal parts too small for drill press operations during manufacture of Bomarc ramjet engines, the Ogden, Utah, Div., Marquardt Corp. is using an electrical discharge milling machine that removes metal by electric sparks much like the eroding effect of sparks

on the electrode of a worn automotive ignition plug.

The device, called the Elektrojet Electrical Discharge Machine, is made by Cincinnati Milling Machine Co. and can be used for high accuracy tool sharpening, surfacing, forming, die making of all man-made metals that conduct electricity.

When high energy sparks jump between electrode and workpiece under controlled conditions, sparks will erode the workpiece in the shape of the electrode. The surface of the electrode is also subject to erosion, but at a much reduced rate.

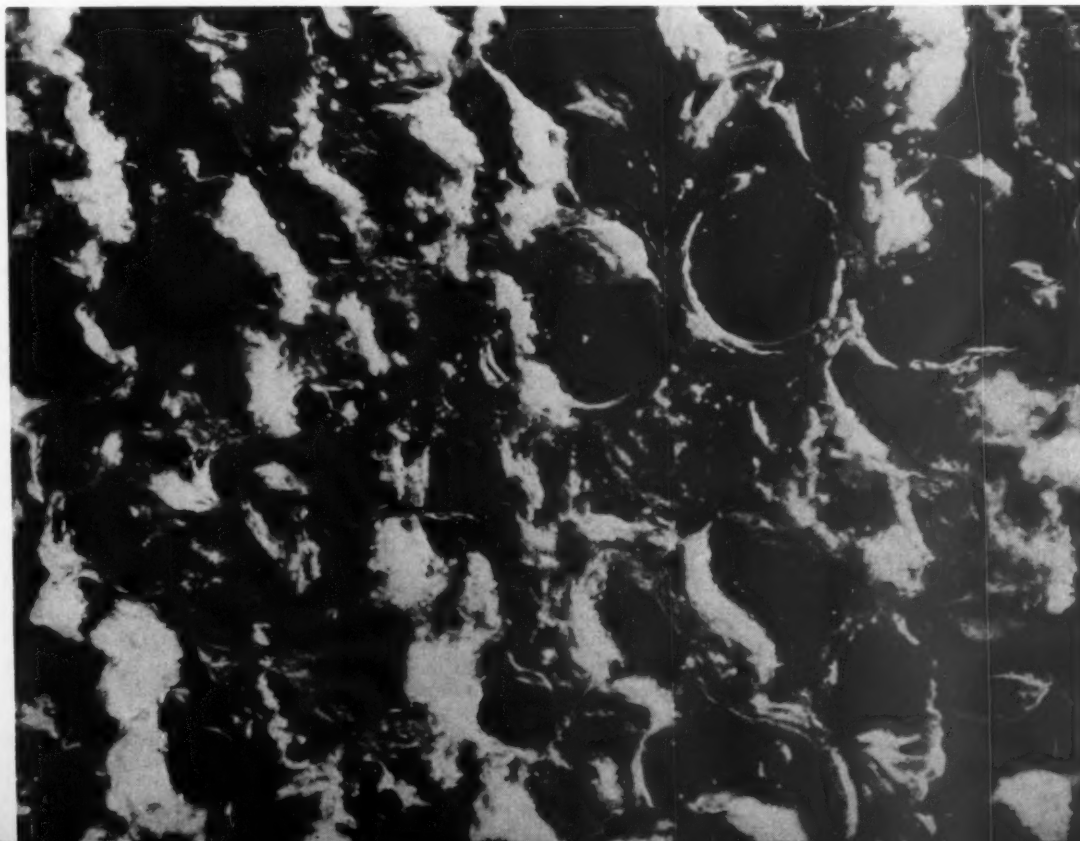
Cycling from 10,000 to 250,000 times a second, sparks flash from electrode to workpiece across a gap of .001-in. The machined area is submerged in dielectric fluid to quench sparks and to flush out metal debris.

A surface machined by sparks appears grainy and covered with tiny craters when examined by photomicrographs. Where each spark hits, a tiny molten glob of metal is ejected and an additional quantity vaporized.

The machine is said to have potential for jobs where problems of distortion, burrs, and differential heating are created by conventional machining. It is usable for materials too hard or too brittle for machining by other means.

The Elektrojet line is designed to produce bottom corner radii as small as .002-in. and bottom corner radii of .008-in. at regular production speeds are routine. Machining does not change the structure of the metal except perhaps at the very surface.

PHOTOMICROGRAPH CLOSEUP of surface finished with Elektrojet unit shows craters and plateaus created by spark machining process.



MATERIALS FOR PRODUCTION — what's happening in 1960?

New developments and trends indicate industry is entering a period of radical change in its use of different types of production materials. Nowhere is this so pronounced as in the West.

FEW AREAS in industry are experiencing such rapid changes in concept as that of production materials. We are entering an explosive period of development in new materials and new variations of accepted materials. Steel, plastics, and aluminum, the three most widely used industrial materials are bringing out new alloys with characteristics that open up entire new industrial fields to materials previously not considered as practical.

Aluminum is being used for applications formerly reserved for steel; electrical conduit, engines, highway signs. Steel has invaded the aluminum field and is a production material for aircraft and missiles. Plastics are invading areas only a year or so ago thought impossible.

Industry's concept of a material's usage based on limitations and production costs of a few short years ago, is no longer valid. Boundaries, which had previously existed are rapidly being crossed and broken by new types of alloys. Increased usage is bringing down costs of many materials, permitting them to move into areas previously serviced by other types of materials. This trend, while apparent for some time, has been greatly accelerated in the last year. In the West, the changes are particularly pronounced. Spark-plugged by aircraft, missile and electronic companies, industry in the West is making parts with new and unusual types of metals, plastics, and ceramics. In many cases, Western firms are using production techniques far in advance of the rest of the country.

If the trend continues at this rate, and most observers feel it will be increasingly greater, many industries will be using a different type of production material than they now use. Companies are becoming aware of this situation. Firms, who previously paid little attention to materials and concentrated engineer-

ing efforts on production techniques, are starting to re-evaluate their basic production materials.

To give an indication of what's happening to various production materials some of the more common ones are covered below.

STEEL

Steel is still the most widely used production material. Steel tonnage is going up. In January, for the first time, monthly steel production in the United States reached the 12 million ton mark. The iron and steel industry this year is planning to spend some 1.6 billion dollars for new equipment and facilities.

A large percentage of total steel production is in low alloy steels in sheets, bars, plates and structural shapes. Very little is changing in the low alloy steel picture. Some improvements have been made in quality, due to improved production processes, but low alloy steels represent an extremely effective and inexpensive production material difficult to improve upon without increasing costs.

There is some talk of eliminating most of the similar, but slightly different types of low alloy steels in favor of concentrating on production of five standard types. The Russians have done this with some success. While the above is only talk, it indicates the thinking of some of the steel people.

Though few developments metallurgically have been made in low alloy steels, there have been a number of recent advances in coating them. Armco is producing a hot aluminized steel sheet. Its use is on the way up. Present applications include mufflers, reflectors, and furnace parts. Aluminized iron is also coming. Aluminum provides a more durable coating than zinc, although it lacks zinc's galvanic effect. Developments are being made in glass coating of steel. One firm.

A. O. Smith Corporation, has developed a glass coated steel smokestack, available in colors. Such a coating provides a corrosion resistant protection against attack by acids. U. S. Steel is producing vinyl coated steel sheets, that can be formed, fastened, and welded and have a number of advantages as a production material. (See the article in this month's issue entitled "Metal Coatings Cut Production Costs").

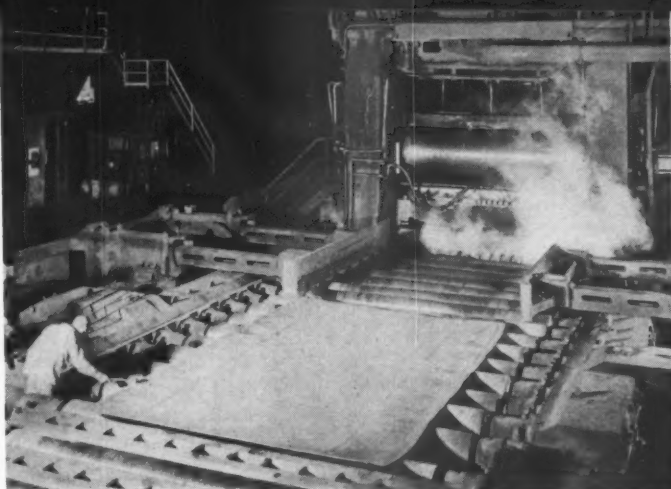
Two significant trends are taking place in steel.

One is the widespread use of stainless steel. Stainless, chiefly because of its corrosion resistant properties, it is finding more and more applications throughout industry. Look for increased usage of stainless steel in such applications as kitchenware, panels, pumps, missiles, and the atomic energy field. Use of stainless steel castings is also on the upswing. Some stainless steels are being used in supersonic aircraft and missiles because of other properties, a high strength of weight ratio, and an ability to withstand extreme cold. North American Aviation is using a new stainless steel PH 15-7 Mo, rolled in panels .006 in. thick, and brazed to a honeycomb core. This has an ultimate tensile strength range of 225,000 to 260,000 psi. The honeycomb sandwich paneling is used as the main exposed surface of North American's B-70 bomber.

The second trend in steel is just beginning. In the last year or so, there has been a major breakthrough in the use of high tensile strength steel. High tensile strength heat treatable steels are not new. High carbon tool and die steels are of this type. What is new, is that for the first time, we are beginning to learn how to work these steels. We are making structures with them, and in learning how to do this, have acquired a new production material.

Up to now, the usage of such high strength steels has been in the missile and aircraft fields. It was brought about by the military, when there was a need for a strong light weight material, and no existing production material was available. Steel mills working with these groups have succeeded in a revolutionary effort to roll such steels into large thin sheets. Procedures have been developed for their welding and brazing.

METALLURGICAL ENGINEER John M. Hodge holds samples of Airsteel X-200, ultra high strength alloy sheet steel he developed for U. S. Steel.



NEW SANDWICH method of rolling thin stainless steel sheets to 90 in. widths. Inside welded carbon steel covers are stainless sheets.

Steel companies have developed a number of new steels of this type. Typical of the group is a steel developed by U. S. Steel, Airsteel X-200. Airsteel X-200 is an air hardenable steel, that after tempering develops tensile strength levels in the 280,000 pounds per square inch area without oil or salt quenching. Its tensile strength level is six times greater than that of sheet steel used in automobile bodies. This strength permits thinner sheets to be used and cuts missile weight.

Another steel recently developed by U. S. Steel is Strux, a super tough low alloy constructional steel that can be heat treated to develop tensile strengths up to 300,000 psi. For a given weight and size, parts from Strux are some 7% stronger than those made from the usual low alloy constructional steels, or parts can be made 7% lighter in weight to achieve the same strength. Strux forgings are being used in the main and nose landing gear assemblies built by Bendix Products Division, Bendix Aviation Corporation, for North American's A3J Vigilante, a supersonic attack aircraft.

The importance of this breakthrough and trend in the use of high strength to weight steels, besides its obvious importance to national defense, is that it is bound to have a future use by all industry. Industry has needed such a production material for some time. As further developments are made, many industrial applications are obvious. There is a broad trend towards part miniaturization. These steels have uses here. Also, there will be applications, where despite the additional cost per pound, this type of steel will be used because weight reduction can reduce part size and thickness to a point where it is more economical to use than less expensive per pound steels. Typical future uses may be such items as transmission housings and speed reducers.

ALUMINUM

Aluminum use is soaring. Total industry shipments increased from 3,570 million pounds in 1958 to 4,900 million pounds in 1959. As a production material, it is working into almost every industry. As an indication of aluminum's increased use, the aluminum in-



TRAILER FOR TRANSPORTING liquid oxygen is constructed from aluminum, an example of the metal's usage in transportation field.

dustry lost a major part of one of its largest customers when the aircraft industry turned to steel for building supersonic planes, yet this loss was easily absorbed in new and increased uses of the metal.

Any number of aluminum alloys have been developed, which coupled with aluminum's natural advantages of being light in weight, having good electrical conductivity and resisting corrosion, have made this metal a versatile production material. Aluminum's strength to weight ratio is being increased by new alloys and it is possible that aluminum may in the future, approach steel in this area. A lithium-aluminum alloy is being used as a skin for the North American A3J Vigilante attack bomber.

Aluminum has been found to have a number of desirable properties for cryogenic equipment. Kaiser's aluminum alloy 5083, when tested for tensile and impact properties of plate and welds, had no ductile-brittle transition in the plate or weld at temperatures as low as -320°F .

As a production material, aluminum is finding new applications in almost every field. Aluminum electrical conduit is beginning to challenge the use of zinc coated steel conduit in industrial wiring installations. Aluminum beer cans are being manufactured on a high speed can line built by E. W. Bliss Co., that can turn out tested can bodies at speeds up to 450 per minute. Aluminum highway signs are making their appearance. The armed forces are using aluminum bodies on tanks and other track laying vehicles such as personnel carriers. Cast aluminum bus bar was recently used to feed a 7500 ampere anodizing tank at Aluminum Extrusion Company's Los Angeles plant. Designed to carry 840 amperes for square inch, the installation resulted in a savings of 30% of the cost of a copper bus with equivalent capacity, and installation cost was 65% that of copper bus due to light weight handling and ease of bending.

PLASTICS

Of all the production materials, plastics have seen the most change. Plastics production was up 25% in

1950 to 5,600,000,000 pounds raw materials and estimates by the Society of Plastics Industry are for a 15% increase in 1960 over 1959. Plastics production in pounds in 1959 topped the 4.8 billion pounds of aluminum and ranked second only to steel according to Robert B. Jacob, President, Cadillac Plastic and Chemical Co. He said, "The full significance of that comparison isn't apparent until you realize that aluminum is twice and steel six times as heavy as the average plastic."

Some of plastics' most significant gains have been in engineering and industrial applications. They are making great inroads on metals and older materials for such components as gears, bearings, housings, and mechanical parts.

An unusually large number of new plastics have been commercially available within the past year. Nearly all are in the category of extra-tough engineering materials. Among them are:

Nylon 6, a new type of plastic, which is identical with the conventional nylon 66 in most respects but is several times as impact and shock resistant. It may be readily processed in heavy sections, and is machineable to closer tolerances. There is a great future for it, particularly in heavy gears, bearings, conveyor screws, and pipe.

Delrin, DuPont's new acetal plastic, has exceptional tensile strength, stiffness and resistance to fatigue and creep. It has low moisture absorption and excellent dimensional stability. In the future it may replace die cast and machined metal parts.

Polypropylene is similar to polyethylene, but is even lighter, much stronger, and more rigid and almost a 100 degrees more heat resistant.

Polycarbonates, now available from two manufacturers, are extraordinarily impact resistant, have high heat stability, and are available in transparent form.

Penton (Hercules' chlorinated polyether) has exceptional chemical and heat resistance, approaching Teflon in these respects, although less expensive.

The ABS copolymers (acrylonitrile-butadiene-styrene) are not new but just are catching on in volume and only recently became available in warehouse shapes. This is an extremely high impact, easily formed plastic, and one of the lowest cost high impact

BUS BAR of aluminum is placed in position by workman at Aluminum Extrusion Co. Bus will feed 7500-ampere anodizing tank.



materials. It is being used for housings, ducts, containers, etc.

Among the most promising plastics are glass base laminates, such as epoxy and silicone. These materials possess very high mechanical strength and good electrical properties.

TITANIUM

Titanium is being used in the chemical, paint and marine industries. As a production material titanium has a great future potential, similar to that of aluminum. While being used in a number of industrial applications, production has not reached the point where cost will make it competitive with such high volume metals as steel and aluminum. Titanium is ideal for army missile applications due to its weight-strength ratio. In addition, more information is needed on working the metal. Look for titanium to start challenging aluminum and steel in about five years.

COPPER

Copper's biggest field has been the electrical industry. Aluminum is making big inroads here. Copper is also widely used in the plumbing and building industries and has gained in use in plumbing. Instability in copper prices has led to substitution of other materials. In one to three years, copper supply will exceed demand, and this could lead to a more stable price structure.

Dispersion hardening, a new technique, can make copper alloys as strong at 1000 degrees F. as 18 chrome nickel stainless steel, and still possess 80-85% of thermal conductivity.

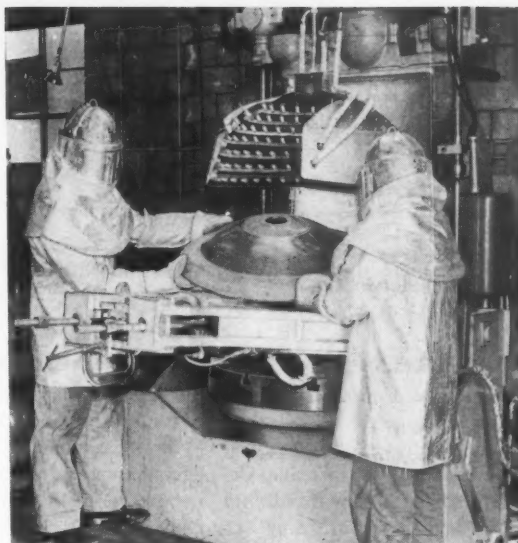
Copper is a metal that has a good future as a production material. It has not been explored metallurgically as much as some of the other metals. A question still to be answered, is how trace elements affect copper. The copper industry has recognized this need for additional research and an association headed by Clyde William, retired director of Battelle Institute, has been set up to do research on copper and find new and expanded uses for it. It is likely that copper will have increased usage as a future production material.

NICKEL, CHROMIUM

Both of these metals are on the move up. Their greatest use is as alloys of steel. Chromium is the main alloy in stainless steel, and is also used in many of the other steels. Nickel's use as a base alloy is also increasing because of its high temperature properties. Higher percentage nickel alloys are appearing, and there is more use of pure nickel. Our metallurgical knowledge of nickel alloys is also increasing. We now know that one of the things affecting nickel base alloy is that they are picking up magnesium in infinite amounts. Just recently, metallurgists have learned how to measure this.

REFRACTORY METALS

The most important of these metals are tungsten, molybdenum, columbium and tantalum. Others include zirconium, beryllium, vanadium, and chromium. Refractory metals possess super high strength-high temperature qualities and must withstand temperatures of



SPINNING TITANIUM on vertical roll spinning machine, a new fabrication technique developed by Titanium Fabricators, Inc.

over 2000 degrees F for extended periods while retaining strength. At these temperatures, some refractory metals can maintain a strength of 15,000 psi for 24 hours. Temperature requirements are being pushed steadily up by missile manufacturers

As production materials, there is no big use for refractory metals now. They could have a sizeable future use for such items as gas turbine engines. Until a year ago, the highest temperature in jet blades was 1700 degrees F. Refractory metal development has proceeded rapidly. At the present time, most of these metals can be worked.

Refractory metals have one bad feature. They are extremely reactive to one or more common gases, such as oxygen, hydrogen, nitrogen, and become brittle upon exposure.

Tungsten because of its high melting temperature of 6100 degree F has perhaps the best future of any of this group. Tantalum has the property of being able to resist corrosion in strong acid. Columbium has two attributes, a low thermal cross section, and the fact that the metal does not stop neutrons. In pure form it is readily workable. Columbium is about \$50.00 per pound now. Its cost will come down in the future, though probably not below \$10.00 per pound.

WOOD

The wood industry is developing low cost high strength to weight laminated beams using some of the newer resins. A number of new applications for these have been found in the industrial building field. Another interesting development is utilization of wood previously considered useless. This is ground and mixed with a binder and made into sheets suitable for building purposes. Wood has extremely limited applications in the manufacturing industry. What is used is mainly in bearings and gears.



HELPFUL LITERATURE

FOR THE WEST'S PLANT OPERATING EXECUTIVES

FOR YOUR FREE COPY

CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, P. 57

VIBRATING FEEDERS

A complete line of motorized counterweight vibrating feeders, more than 60 sizes, are illustrated and described in this new booklet. The machines described are compact, low headroom devices for feeding a wide range of bulk materials from heavy, sticky ores to light, dry grains, at a uniform rate from bins, hoppers, storage piles or conveyors. *Link-Belt Co.*

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THE ROOT OF THE THREAD

This 24-page booklet is predicated upon the thesis that the weak spot of properly made tension bolts and screws is the contour of the bottom, or root, of the screw thread. The booklet discusses a re-evaluation of the root due to the increased demand for higher reliability and reviews a particularly promising root radius. *Standard Pressed Steel Co.*

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AIR PURIFICATION

Bulletin introduces new high velocity air valve and explains how control air pneumatically activates neoprene tubes encased in aluminum vanes. Other construction and performance features, including true linear modulation without hysteresis and constant relation of control to output, are described. *Air Conditioning Supply Co.*

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BOXES, CRATES AND PALLETS

Brochure outlines and illustrates various sizes of standard pallets: the reversible flush type, the non-reversible flush type, the full open sling, and the four-way entry pallet. Also depicts four styles of nailed wood boxes and four kinds of plywood boxes as well as types of blocks, crates and skids for various uses. *Hunter Woodworks*

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STATIONARY COMPRESSORS

New 24-page bulletin describing air compressors includes specifications on three basic models of the semi-radially constructed units ranging from 1385 cfm. to 1948 cfm. at 125 psi. Vital information on "package" design, components, intercooling, lubrication, motor mountings and accessories are fully illustrated and explained. *Joy Mfg. Co.*

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REVISED MULTIPRESS BULLETIN

The versatility of a line of multipresses, with special emphasis on new models, is discussed in this 24-page bulletin. Contains case-history pictures, and describes various multipress applications. Cutaway and dimensional drawings illustrate features including exact control of ram speeds, pressures, strokes and action. *Denison Engineering Div., American Brake Shoe Co.*

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DUST COLLECTORS

Included in new 16-page illustrated two-color brochure is a list of typical industry applications of a line of dust collectors. Covered are those for power plants, steel production, cement and aggregate production, chemical and petroleum processing, food and grain processing. Operating characteristics are described. *American Standard Industrial Div.*

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HIGH PRESSURE EQUIPMENT

Details and specifications for a line of high pressure measuring instruments, compressors, pumps, valves, vessels, gauges and similar equipment are given in this catalog. Included are valves for pressures to 150,000 psi., multiple dead-weight testers and pressure balances for various pressure ranges. *High Pressure Equipment Co.*

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DOCK BOARDS

New catalog describes line of dock boards including a new drop pin which automatically positions the dock board between the rail and the dock. A selection chart lists available models, width dock end, length and span adjustment. Discusses features of tire saver flared curbs, rugged reinforced box-type understructure and all steel welding. *Hamerslag Equipment Co.*

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NEW COATING PROCESS

Engineering data report describes a coating process for oxidation, corrosion and abrasion resistance. Discusses physical, chemical and fabrication properties of the surface protection provided by the new process, covers application methods, thickness specifications and fusing procedures. *Stainless Processing Div., Wall Colmonoy Corp.*

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SAW BLADE HANDBOOK

Guides for getting maximum cutting performance and blade life are included in this 36-page handbook-catalog. Shows how to select proper blade, correct feed, speed and tension. Common cutting problems and their solution are tabulated along with recommendations for cutting a wide variety of metals and non-metals. *Ladish Co.*

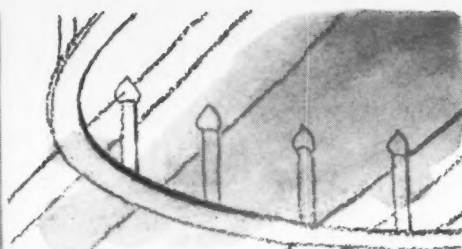
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WELDING OF ALUMINUM

New developments in the welding of aluminum are described in this 12-page booklet. Discusses plate welding and the development of the square-butt technique. Explains welding with small-diameter wire and discusses modern, inert-gas welding processes and spot welding. *Linde Co., Div. of Union Carbide Corp.*

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**"When we talked about
the Plan person-to-person,
participation jumped 30%!"**

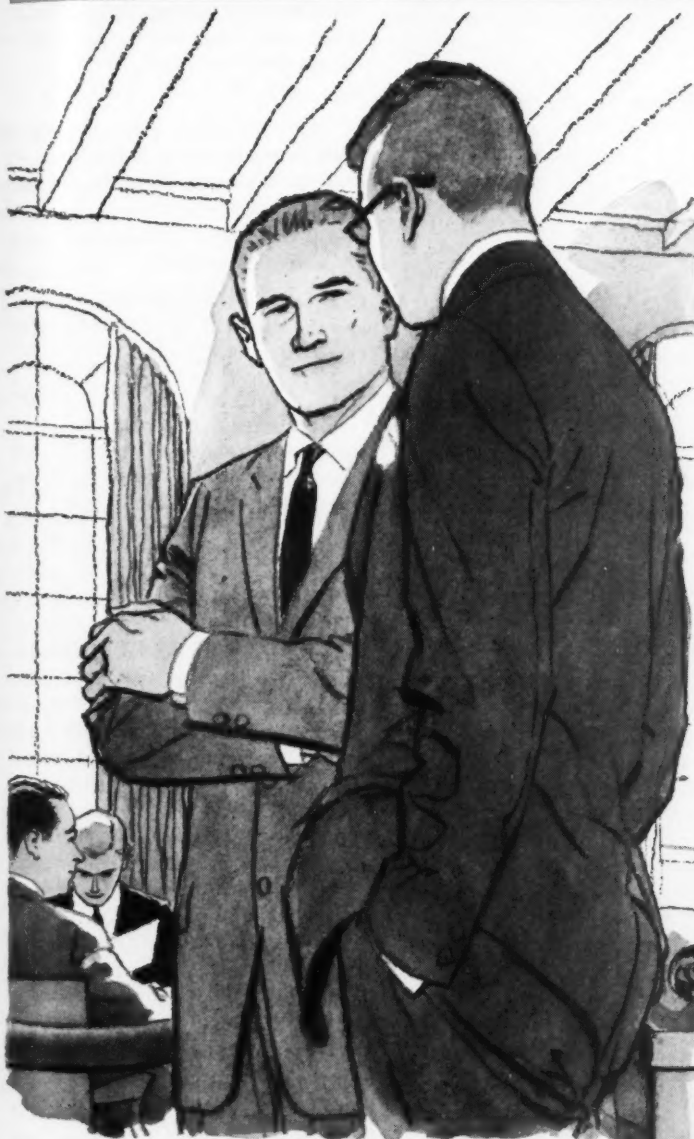


In our company we've made the Payroll Savings Plan available for some time. I thought, naturally, that we had a large participation. But when I checked up a few weeks ago I discovered that only about 22% of our people were making use of the Plan. It's so easy to say, "Sure, this is a fine idea, and I'll sign up next payday."

What our people needed was someone to explain this convenient savings plan *in person*; someone to show them that just signing the card would put this fine thrift program into automatic operation. They needed somebody to invite them to *start right now*.

When I contacted our State Savings Bonds Director, he helped us set up a thorough, informative canvass of everybody on our staff. As a result more than 30% additional employees signed up for this easy, systematic way to buy U.S. Savings Bonds, *regularly*.

Perhaps *your* organization, too, has a large percentage of employees who have *never been invited* to combine patriotism with basic thrift through the Payroll Savings Plan. Companies with high employee participation are enthusiastic about its benefits in terms of lower employee turnover, better safety records, and the satisfaction engendered by helping large numbers to contribute to our Nation's Peace Power. The greater your employee participation, the more substantial your company benefits will be. Contact your State Savings Bonds Director for prompt, practical help in spreading Payroll Savings information, *person-to-person*.



NOW! U. S. SAVINGS BONDS EARN 3 $\frac{3}{4}$ %

WESTERN INDUSTRY



THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

LITERATURE ADVERTISED IN THIS ISSUE

Air control devices for cost control. *Perfecting Service Co.*
Page 64 Circle No. 29

Heavy duty belt for tough conveyor jobs. *Ton-Tex Corporation.*
Page 77 Circle No. 43

Fences help business, increase safety and security. *Anchor Fence Div., Anchor Post Prod. Inc.*
Page 53 Circle No. 22

High voltage cable has own flexible metallic conduit. *Anaconda Wire & Cable Company.*
Page 11 Circle No. 7

Lightweight Teflon hose costs less, more flexible. *Aeroquip Corporation, Western Div.*
Page 65 Circle No. 32

Chain assemblies, make your own with no welding or peening. *Columbus McKinnon Chain Corp.*
Page 56 Circle No. 25

Lubriplate Data Book, treatise on lubrication. *Lubriplate Div. Fiske Brothers Refining Co.*
Page 79 Circle No. 45

Fire prevention in industrial buildings. *Colt Ventilation of America, Inc.*
Page 5 Circle No. 3

Rotary pumps for positive pumping. *Viking Pump Company.*
Page 81 Circle No. 46

High pressure pumps for low maintenance. *John Bean Div., Food Machinery & Chemical Corp.*
Page 78 Circle No. 44

Multiple torch machine cuts intricate shapes from steel plate. *Air Reduction Pacific Co.*
Page 6 & 7 Circle No. 4

Trucks, casters, wheels, wide selection, fast service. *Nutting Truck & Caster Company*
Page 71 Circle No. 37

Roller chain catalog, shows 36 methods of chain adjustments, 100 pages. *Acme Chain Corporation.*
Page 51 Circle No. 21

Color system catalog includes color charts and applications. *Rust-Oleum Corporation.*
Page 36 & 37 Circle No. 18

High strength steel, metallurgical data in technical brochure. *Ducommun Metals & Supply Co.*
Cover 3 Circle No. 52

Connectors, stainless steel, flexible, absorbs vibration up to 1200° F. *Universal Metal Hose Co.*
Page 63 Circle No. 27

Lubrication reference guide to economical equipment operation. *Standard Oil Company of California.*
Cover 2 Circle No. 1

SURFACE MEASUREMENT DATA

Pocket-size, handy, 12-page surface measurement reference manual contains important excerpts from the American Standard ASA B46.1-1955 for Surface Roughness, Waviness and Lay. Covers classification of surface characteristics, stylus-type measuring instruments, precision reference specimens, roughness width cutoff, and notes on control of surface roughness. *Brush Instruments, Div. of Clevite Corp.*

... FOR YOUR COPY, CIRCLE NO. 141

INSULATION PRODUCTS

Thermal insulations for all types of commercial and industrial requirements, in applications ranging from —400 deg. F to 3000 deg. F, are described in new 54 page catalog. Specialized sections cover industrial and high temperature; plumbing, heating, and air conditioning; refrigeration; insulating firebrick and refractories; finishes and weatherproofing materials; and miscellaneous insulations. *Johns-Manville*

... FOR YOUR COPY, CIRCLE NO. 143

CONVEYOR-TYPE CENTRIFUGALS

Brochure describes new line of centrifuges for recovering solids from suspensions and slurries. Bulletin features photographs, specifications and dimensions of the new equipment. Of special significance for the chemical processing, food processing, vegetable oil refining and fish reducing industries, the three types consist of a conical bowl, a cylindrical bowl and a combination of the two. *De Laval Separator Co.*

... FOR YOUR COPY, CIRCLE NO. 145

ELECTROFORMING MANUAL

Current uses for electroforming is a 32-page handbook for designers, engineers and manufacturers. Discusses latest technical information on the process of building a structural part by electro-deposition used in such fields as phonograph records, radar and aircraft structures. Describes the process, where used, tips for designers and charts of engineering data. *Allied Research & Eng. Div., Allied Record Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 142

PRESS BRAKES

Catalog of enlarged and modernized line of press brakes for numerous jobs in the 90 through 1,500-ton work range. Describes and illustrates design features, special work area provisions, typical forming and bending dies, tables for computing bending, punching, and blanking tonnages, die space and filler block dimensions as well as comprehensive specifications are included. *Niagara Machine & Tool Works*

... FOR YOUR COPY, CIRCLE NO. 144

WELDING TECHNICAL DATA

This 50-page book is designed as a combination catalog and welding manual; contains an engineering section with detailed explanations of how to achieve optimum welds under various conditions and tips on how to cut costs and boost the number of welds per hour through good welding practices. Includes dimensional data on stock weld nuts, weld screws, special purpose weld parts and leg levelers. *Ohio Nut & Bolt Co.*

... FOR YOUR COPY, CIRCLE NO. 146

SURFACTANTS FOR PULP INDUSTRY

This booklet describes a variety of surfactants in the manufacture of pulp and paper. Lists four surface-active agents and discusses their uses in various phases of pulp manufacture, in paper and paperboard manufacture and in the washing of woolen paper-machine felts, in the de-inking of paper and the stripping and cleaning of rag stock. *General Dyestuff Co., Div. General Aniline & Film Corp.*

... FOR YOUR COPY, CIRCLE NO. 147

TEMPERATURE-HUMIDITY TESTING

Environmental test equipment that duplicates global climatic conditions, test cabinets large and small, baths, ovens, steam-humidity chambers and bacteriological incubators are among the instrument described in this 41-page catalog. Includes illustrations, descriptions, applications, and a temperature conversion chart. *American Instrument Co.*

... FOR YOUR COPY, CIRCLE NO. 148

TIME-SAVING DEVICES

A new catalog of time saving devices for production, inspection and the tool room. Includes illustrated uses of a multi-purpose work holder for production and tool room use; three models of hand tappers and accessories; a universal tap and die guide for drill press and lathe tapping and threading; and illustrated uses of a master angle plate. *Lassy Tool Co.*

... FOR YOUR COPY, CIRCLE NO. 149

USED MACHINE TOOLS

Eight basic questions on how to get the most machine for the money are answered in a concise, illuminating manner in this 12-page booklet entitled "How to Buy A Used Machine Tool." Designed as a double-check brief guide for the prospective buyer of used machinery. *S & S Machinery Co.*

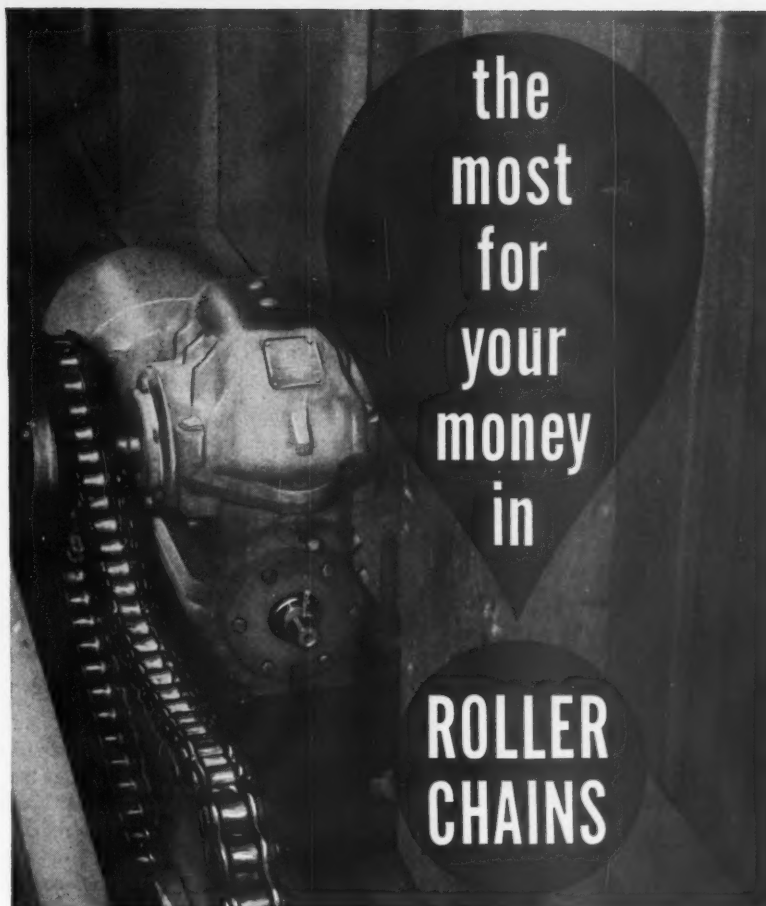
... FOR YOUR COPY, CIRCLE NO. 150

NEW WATER CONTROL CONCEPT

Brochure describes a new concept for feeding balanced chemical treatment into circulating water systems of cooling towers and evaporative condensers. Contains schematic of the small, lightweight, closed reservoir; lists advantages, features and a comparison chart. *Erlen Products Co.*

... FOR YOUR COPY, CIRCLE NO. 151

WESTERN INDUSTRY/MARCH 1960



the
most
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**ROLLER
CHAINS**

ACME Roller Chains are recognized as the symbol of rugged dependability and accuracy in the lumber industry. They are engineered to handle the heaviest loads under the most arduous service conditions—without friction loss or slippage.

If your requirements call for drive chains requiring glass-hard wearing surfaces, highest tensile strength and ability to stand up under the most rugged wear or high speed operations, ACME is the chain that will give you the most for your chain money. Acme roller chains are available in a complete range of sizes from $\frac{1}{4}$ " pitch to $2\frac{1}{2}$ " pitch.

Field engineering service is yours for the asking. Phone your nearest ACME distributor. He has the full cooperation of ACME's Engineering Staff.



Write Dept. 2-W
for new 100-page
illustrated technical
catalog including new
engineering section
showing 36 methods of
chain adjustments.



COMPLETE LINE OF ROLLER CHAINS AND SPROCKETS • DOUBLE PITCH
CONVEYOR CHAINS • STAINLESS STEEL CHAINS • CABLE CHAINS •
FLEXIBLE COUPLINGS • STANDARD AND SPECIAL ATTACHMENTS

... for more details, circle No. 21 on Reader Service Postcard

WELDING EQUIPMENT

Kit contains description of firm's specialized equipment, principally weld positioners and roll planishers. Includes three treatises on typical welding machinery and examples of its use of honeycomb, roll planishing equipment, and stainless steel tubing. Gives eight photo examples of typical contract products. *Airline Welding & Engineering*

... FOR YOUR COPY, CIRCLE NO. 152

ASSEMBLY COST SAVINGS

A total of 17 case histories in this fully illustrated new brochure describe assembly savings achieved in industries ranging from toys to dishwashers to box cars through use of fasteners from a selection of more than 9000 variations. One case history shows how an air conditioner manufacturer effected assembly cost savings of 80%. *Tinnerman Products, Inc.*

... FOR YOUR COPY, CIRCLE NO. 153

TOGGLE SWITCHES, ASSEMBLIES

New 32-page catalog on high-performance toggle switches and toggle switch assemblies for use in airborne, mobile, marine, electronic, and commercial applications. Includes military versions as well as pull-to-unlock, hermetically sealed, electrical memory, rocker-actuated, and miniaturized designs. *Micro-Switch, Div. Minneapolis-Honeywell Reg. Co.*

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RADIAL DRILL PRESS

Bulletin includes 12 close-up photos of a new drilling tool that can drill to the center or at any point on a 32-in. sq. The bulletin also discusses the versatility of the new tool which in addition to drilling can also do sanding, shaping, routing and many other operations. *Rockwell Mfg. Co., Delta Power Tool Div.*

... FOR YOUR COPY, CIRCLE NO. 155

NON-SPARKING SAFETY TOOLS

More than 400 safety hand tools for almost every type of hazardous condition are included in this 24-page, illustrated catalog. Recent introductions include two sizes of channellock pliers, a small adjustable end wrench, several styles of air hammer chisels and 18 sizes of allen wrenches. *Ampco Metal, Inc.*

... FOR YOUR COPY, CIRCLE NO. 156

NEW RUBBER-LIKE MATERIAL

Technical brochure describes new material and contains charts showing physical properties, applications and advantages. A cast, or solid urethane material, the new rubber-like material can be made into molded or machined finished parts and is also supplied in sheet stock. *Dayton Rubber Co.*

... FOR YOUR COPY, CIRCLE NO. 157

HIGH TENSILE BOLTS

A major break-through in the fatigue life control of threaded fasteners is reported in this new 32-page design manual. Includes 17 pages of findings related to the basic nature and causes of fastener fatigue; detailed drawings of new self-locking nuts; and applicable fatigue performance test results. *Elastic Stop Nut Corp. of Am.*

... FOR YOUR COPY, CIRCLE NO. 158

LIGHT WEIGHT AIRCRAFT BOLTS

Illustrated bulletin describes a new line of high-strength aircraft fasteners which permit weight reductions of as much as 50%. Explains that vital weight saving was achieved by reducing the 12-point wrenching size of the head as well as the bearing surface diameter. Design features and specification data are cited. *Standard Pressed Steel Co.*

... FOR YOUR COPY, CIRCLE NO. 159

ROLLER CHAINS AND SPROCKETS

56-page bulletin covering line of roller chain and taper-lock sprockets. Photos and diagrams show construction details and emphasize advantages of taper-lock sprockets for easy and secure mounting on shafts. Includes data on installation of roller chain drives, calculation of center distances, hp. ratings, and conveyor engineering. *Dodge Mfg. Corp.*

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PROTECTIVE MAINTENANCE

Informative new brochure in non-technical language describes a number of protective maintenance coating systems and matches them with specific application problems. Illustrated, each page carries an index tab which indicates where a particular system should be applied, explains outstanding features of each system. Insert folder contains corrosion test results. *Glidden Co.*

... FOR YOUR COPY, CIRCLE NO. 161

PRINTED CIRCUIT BOARD HOLDER

Data sheet illustrates and describes advantages of printed circuit board holder which will hold any board up to 8½-in. wide, and greater widths with longer rods. Shows various quickly adjustable working positions including horizontal, vertical and angular. Discusses easy flip-over feature for working both sides and quick locking clamp. *Macdonald & Co.*

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BREADBOARD COMPONENTS

Compact new technical booklet on mechanical breadboard components. Illustrated, the 24-page booklet offers numerous design hints and recommendations for instrument engineers and designers. Discusses how to solve instrumentation development problems and lists do's and don'ts of mechanical assembly. *Pic Design Corp., sub. Benrus Watch Co. Inc.*

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PROVING RINGS

Illustrated booklet describes complete lines of dial-indicator and optical proving rings; instruments of force measurement used to calibrate other devices and to measure applied loads accurately. Also describes light-weight 150,000-lb. capacity calibration press in which small devices can be calibrated with a proving ring. *Steel City Testing Machines, Inc.*

... FOR YOUR COPY, CIRCLE NO. 164

GLASSED-STEEL REACTOR

Installation, operation and maintenance procedures for glassed-steel reactors are carefully detailed in this new manual. Contains information on proper gasketing, jacket-cleaning techniques and repair procedures for severe and mild chemical service. A special section is devoted to thermal shock. *Pfaunder Co.*

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VALVES FOR FLUID FLOW

Booklet on valves for fluid flow and condition control details such design and selection factors as function, application, and method of actuation. Contains engineering data and illustrations of various types of valves: bypass, relief, check, regulator, shutoff, measuring, sequence, and special purpose. *United Aircraft Products, Inc.*

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CRYOLITE AND ITS USES

Illustrated booklet on the history, physical and chemical properties and uses of natural cryolite. The 24-page booklet contains photos and charts covering density, conductivity and phase diagrams in cryolite systems, and solubility in aqueous solutions of aluminum and iron salts. Thumb-indexed, the booklet is an ideal reference piece for industry. *Pennsalt Chemicals Corp.*

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AUTOMATIC FEEDERS

A complete line of elevating feeders for automatic feeding and orienting of parts is described in this new folder. Details of construction and dimensional data on three standard size elevating feeders of 6, 12 and 20 cu. foot holding capacity are featured. The feeders can handle parts of a wide variety of sizes, shapes and materials. *Detroit Power Screwdriver Co., sub. Link-Belt Co.*

... FOR YOUR COPY, CIRCLE NO. 168

INDUSTRIAL DRYERS, OVENS

Typical installations for paint baking, heat treating, rubber, plastics and ceramic curing and many other similar applications are illustrated in this bulletin. Discusses source of heat and method of heating, types of heaters and construction. Covers typical oven material handling of set-ups. *J. O. Ross Engineering, Div. of Midland-Ross Corp.*

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PLASTIC PIPE FITTINGS, VALVES

Catalog gives full data on line of plastic pipe fittings including tees, ells, couplings, caps, flanges and vacuum cleaner fittings. Outlines features of plastic pipe fittings as corrosion resistant, maintenance free, lightweight and easy to install. Photos illustrate plastic access fittings for electrical conduit. *Sloan Mfg. Co.*

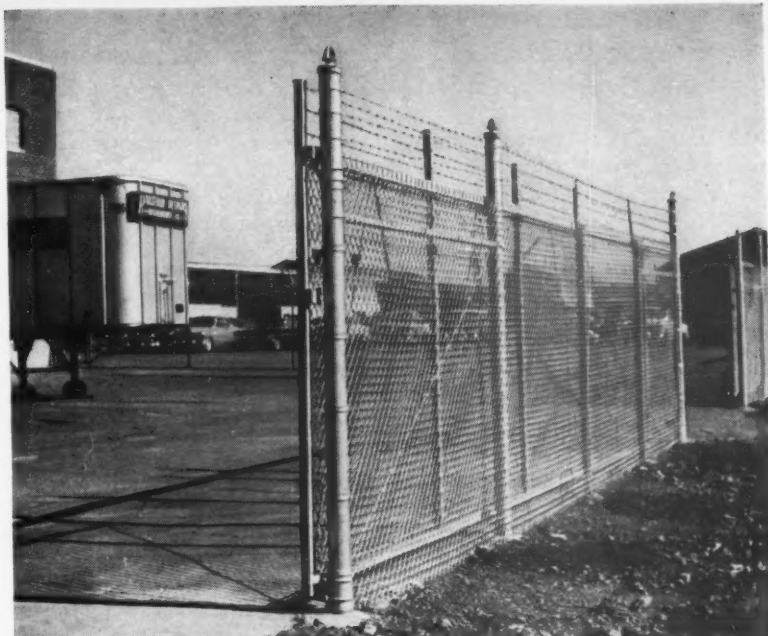
... FOR YOUR COPY, CIRCLE NO. 170

TEXTILE PROCESSING FACTS

New publication contains information about products used in textile wet processing. Titled "Time for a New Look at New Materials," the booklet outlines profit opportunities made possible by new product developments. *B. F. Goodrich Chemical Co.*

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WESTERN INDUSTRY/MARCH 1960



"Customers' increased confidence... is helping business."

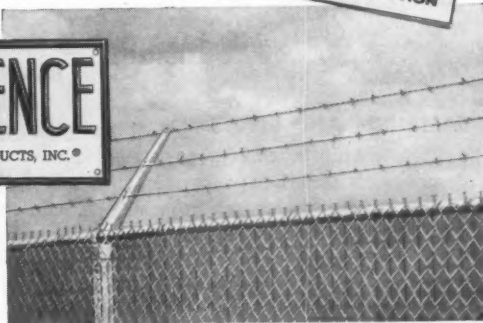
HARTFORD DESPATCH & WAREHOUSE CO., INC., Cambridge, Mass.

"A new Anchor Fence really makes a difference! We have Anchor at all four of our New England branches. Customers' increased confidence in the security of our warehouse facilities is helping business. The neat appearance of the fence spruces up the property and attracts customers. We are able to store materials outside *safely*—a real saving. There has been a definite increase in safety, too. We can control traffic in and out of the plant as well as establish traffic lanes at the property."

For more information on how Anchor Fence can help your operation, call your local Anchor Man. Write for free catalogue to: **ANCHOR FENCE**, 6620 Eastern Ave., Baltimore 24, Md.



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... for more details, circle No. 22 on Reader Service Postcard

PENETRATING MARBLE SEAL

Descriptive literature introduces new penetrating sealer to prevent marble surfaces from staining and discoloring. Discusses the penetrating oil and resin polymerizer that seals the porous surfaces of marble and similar stone products from within. Discusses laboratory test results, application methods and uses on marble and similar stone products, interior and exterior. *Watco-Dennis Corp.*

... FOR YOUR COPY, CIRCLE NO. 172

PORTABLE SWAGER

Illustrated brochure describes a portable swager which incorporates proven design principles previously used in both portable and production machines so that all special and standard fittings, including high pressure types, can be swaged to conform with FAA and military specifications. Includes dimensioned drawings, specifications and capabilities. *Resistoflex Corp.*

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ROLLING DOOR MAINTENANCE

A manual covering maintenance and parts on line of rolling steel doors. The 16-page booklet is organized to help speed up the ordering of replacement parts when doors are damaged, assists in identifying parts. Discusses typical door construction features, inspection periods, door adjustments and continuing maintenance procedures. *R. C. Mahon Co.*

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PUMPS AND CONTROLS

Comprehensive 72-page catalog gives full design details and operating characteristics on a line of hydraulic pumps, fluid motors and valves. A section is devoted to each type, discussing the design and operating characteristics of the components involved. *Denison Engineering Div., American Brake Shoe Co.*

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FASTENERS AND RIVETS

Profusely illustrated 24-page catalog describes complete line of fasteners including featherweights, self-broaching, self-sizing, pull-through blind rivets, friction-lock self-plugging and lock-spindle self-plugging blind rivets. *Buck Mfg. Co.*

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IMPROVED MOBILE CRANE

New 12-page catalog gives full information about a newly improved 15-ton mobile crane, which is easily converted to a $\frac{3}{4}$ yd. clamshell or dragline. Describes some of the outstanding features of the carrier as the two-pin adjustable, double telescopic outriggers and full time hydraulic power steering. Includes full specifications. *Unit Crane & Shovel Corp.*

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LUBRICATION SYSTEMS

Four-color illustrated brochure on complete line of centralized systems of lubrication. The 24-page booklet outlines advantages of centralized lubrication and principles of operations are discussed as well as system components. Includes individual centralized lubrication for small machines and illustrations of typical applications. *Farval Div., Eaton Mfg. Co.*

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DIVERSIFIED PACKINGS

Catalog offers extensive information on 14 distinctive types of fabric, foil, plastic and filament packings in nine unique constructions which are illustrated in large cutaway detailed drawings. General data lists details on composition, application, service information, and temperature limits for each type of packing. *Greene, Tweed & Co.*

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SMALL TUBING DATA

A basic guide to the selection and use of stainless steel tubing ranging from 33-gauge hypodermic needle sizes to heavy-wall high pressure tubing up to $\frac{3}{8}$ -in. Complete, easily-read tables give property data, sizes, tolerance and weight information for all commonly-used shapes and sizes. *Posen & Kline Tube Co.*

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ROUND-CHART RECORDER

Bulletin describes features, application, measurable parameters, and specifications of newly announced line of round-chart single and double-pen recorders. The null-balance, potentiometric-type recorders, and features a high degree of component interchangeability. Includes list of available charts and scales. *General Electric Co.*

... FOR YOUR COPY, CIRCLE NO. 181

AIRCRAFT AND MISSILE CATALOG

A complete design information catalog for aircraft and missile tubing and duct joints covers stock in a wide range of sizes. The 40-page book contains helpful design data and product information on joints suitable for a wide range of temperatures and pressures for gaseous, liquid and air systems, as well as couplings for fastening and sealing applications. *Marman Div., Aeroquip Corp.*

... FOR YOUR COPY, CIRCLE NO. 182

CONVEYOR CHAIN DESIGN

Illustrated manual compiled as a comprehensive engineering reference book for use in the selection of chain for conveying and elevating. Correct application of chains to conveyor systems, development of attachments to increase their versatility and factors in selecting chains are outlined. Includes installation tips, maintenance pointers and a trouble shooting chart. *Moline Malleable Iron Co.*

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SEPARATOR MODULES

Bulletin on impervious graphite entrainment separator modules for effective separation of entrained liquids from corrosive gas streams. Discusses such features as high collection efficiency and low pressure drop, also describes the standard stock modules that can be assembled to fit almost any duct or vessel. *National Carbide Corp., Div. Union Carbide Corp.*

... FOR YOUR COPY, CIRCLE NO. 184

MULTI-PURPOSE CLEANER

Bulletin describes new formula liquid cleaner for removing grease, oil, ink, soot, dirt, light carbon and similar deposits from hard surfaces without heat, fumes or fire hazard. Discusses methods for its use on commonly used metals, plastics, rubber, porcelain, wood and painted surfaces. *Kelite Corp.*

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YELLOW NEOPRENE CORDS

Brochure reporting the introduction of new yellow neoprene portable electrical cords and cables. Discusses advantages of the yellow color in improved visibility, hence safety. Outlines heat resistance, flexibility and ozone resistance of the product. *Western Insulated Wire Co.*

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Clark parts being loaded for an
shipment. The picture from
the Clark Central Parts Depot.

Make sure of the service... before you buy!

Costs start climbing the minute a fork truck goes out of service. The national average for truck downtime is conservatively estimated to be \$16.48 per hour. An important reason why fast, qualified parts service is essential.

It's why Clark dealers offer you the largest inventory of parts in the industry. It's why Clark maintains a 16,000 mile private wire communication system. It's why Clark has built a multi-million dollar parts warehouse near Chicago's Midway Airport.

Everything in the Clark service system is geared to speed. Vital materials handling equipment must be back on the job *fast!* To assure you of fast service Clark provides you with over 117

service facilities throughout the nation... each carrying a complete parts inventory. To back this up, the Clark Central Parts Depot maintains an inventory of over 5 million parts... emergency parts that can be air-shipped to any part of the country in a matter of hours. *Only* Clark offers you this service.

Want to see how it's done? A colorful brochure and a film strip describing this service system are available through your local Clark dealer. You'll find him listed in the yellow pages under "Trucks, Industrial." Or, if you prefer, write direct to: Clark Parts Service, Clark Equipment Company, Battle Creek, Michigan.

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EQUIPMENT**

For full details, circle 77 on reader service card

BOLT TENSION

...it's
tied up
with
quality
control



Correct tension, that is, of bolts, studs, screws, and other fasteners used in product assembly. Without tension control there is no quality control.

For example, uneven tightening of head bolts causes warping and engine trouble. Improper tension of fasteners in aircraft components sets up dangerous stresses and strains. Measuring devices, electronic components, frames, fittings, high-pressure containers — these and many other products require uniform tension on screws and bolts for proper operation.

That is why SNAP-ON® Torqometers® are being used more and more on assembly and maintenance work. These precision wrenches tighten bolts and studs to exact predetermined tensions. Or they may be used to spot check the tension on bolts tightened with power impact tools. Easy-to-read dials show torque measurement in either inch-pounds or foot-pounds.

SNAP-ON offers Torqometers in a wide range of sizes, plus torque drivers for proper tensioning of screws. These are widely used in electronic and electrical assembly.

If exact tension on fasteners is part of your quality control, or if you suspect that lack of such control may be a source of trouble, call in a SNAP-ON Sales Engineer. He can offer qualified advice on torque-measuring problems, and provide a complete range of hand tools and wrenches for assembly or maintenance. Write us or call your nearest SNAP-ON Branch.

SNAP-ON TOOLS
CORPORATION

8032-C 28th Avenue. • Kenosha, Wisconsin



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CM Hammerlok® COUPLING LINK

Make your own
HERC-ALLOY
Chain Assemblies

with all components furnished from
your distributor's stock.

NO PEENING NO WELDING



• Hammerlok is made of alloy steel... is stronger than Herc-Alloy chain... is thoroughly field tested.

• Write for Bulletin and name of your CM Distributor stocking Herc-Alloy chain, master links, hooks and Hammerlok coupling links.



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WESTERN INDUSTRY/MARCH 1960



SPECIAL MANUALS

FOR YOUR FREE COPY, CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, p. 57

PRODUCTION MATERIALS

Plastic Injection Molding

Illustrated brochure discusses production of lightweight, plastic parts in a wide range of sizes and intricate shapes. Chart outlines the general properties of the many thermoplastic materials the firm has available in the form of injection molded parts. *Mueller Brass Co.*

... FOR YOUR COPY, CIRCLE NO. 225

Protective Plastic Coating

Literature describes an all-weather protective plastic coating developed to meet the new Government Packaging Specification. A cellulose acetate butyrate hot dip plastic coating, it will strip at minus 65 deg. F. Publication discusses protective feature during storage and shipment. *Western Coating Co.*

... FOR YOUR COPY, CIRCLE NO. 226

Fir Plywood Catalog

New, quick reference catalog contains up-to-date information on fir plywood standard grades and specialty products for architects, engineers, builders, product design engineers and building code officials. Covers types, physical properties, special products; recommendations for floors, walls, roofs; FHA requirements, components, structural systems and concrete forms. *Douglas Fir Plywood Association.*

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Metal Stock Products

Folder describes a special grade of metal and some of its more usual applications including bushings, bearings, gears, worms and worm wheels, valve seats and guides, hydraulic valve parts, plungers and pump rods. Physical properties are listed and data on extruded rounds, centrifugally cast stock bars, extruded rectangles, stock die blanks and guide pin bushings. *Ampco Metals, Inc.*

... FOR YOUR COPY, CIRCLE NO. 228

Steel Bar Detail Chart

Newly released chart lists nominal dimensions of high strength billet steel bars for concrete reinforcement. The two yield point ranges: 60,000 psi. minimum and 75,000 psi. yield point minimum, are intended for use in concrete structures designed to require steel reinforcing with a higher yield point than that available in the structural, intermediate or hard grades. Chart also sets forth physical properties of new-billet steel. *Columbia-Geneva Steel Div., U.S. Steel.*

... FOR YOUR COPY, CIRCLE NO. 229

Stainless Steel Tubing

New 34-page booklet gives details on the various sizes, grades, design data, corrosion resistance, and other information valuable to industries interested in both welded and seamless stainless steel tubing. More than 25 tables on stainless steel tubing are included, along with photos and other drawings and data. A special section on composite tubing is also included. *Allegheny Ludlum Steel Corp.*

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Plastic Molded Flex Joints, Bellows

Folder describes new line of special molded bellows for aero-space vehicles, ground support equipment, chemical processing and other corrosive fluids handling systems. Also illustrated, the brochure discusses advantages of molded bellows as compared to machined bellows, giving examples of the new line of special molded bellows in solving many problems. *Resistoflex Corp.*

... FOR YOUR COPY, CIRCLE NO. 231

Punches, Dies and Retainers

Catalog of line of precision punches, dies and retainers. Head type punches, manufactured to approved A.S.T.E. standards, are featured. Also, the firm's welded carbide tipped punches are described as not silver soldered nor brazed, but actually welded to the tool steel body making a bond which will not come apart under impact. *Porter Precision Products.*

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Latex Paint Systems for Exterior Wood

Booklet is devoted to latex paint for use over exterior wood as a new and promising application. Describes properties of latexes for exterior wood formulation, exterior exposures and conclusions. Moisture vapor transmission rate is discussed as well as liquid water permeability, adhesion to the wood surface and the effect of moisture on adhesion. Includes oil migration test, with illustrations. *Dow Chemical Co.*

... FOR YOUR COPY, CIRCLE NO. 233

Glass Fiber Reinforced Plastics Panels

Descriptive brochure outlines advantages of the use of reinforced plastic paneling for industrial application, stressing improved lighting at reduced cost. Gives full technical data on light and heat transmission, strength, hardness, flammability, weather effect, impact test and chemical resistance. Chart in folder sets forth types, weight per sq. ft., thickness, widths, lengths and available colors. *Rippolite Plastic Products, Inc.*

... FOR YOUR COPY, CIRCLE NO. 234

High-Temperature Laminates

Two engineering bulletins describe plastics which were developed to provide new materials for the increasing interest in higher temperature laminates. The two bulletins provide basic information on the two introductions and list all the sheet properties of each laminate. *Synthane Corp.*

... FOR YOUR COPY, CIRCLE NO. 235

Honeycomb Stabilizer

Technical data sheet on a hot-melt water soluble compound for honeycomb stabilizing. Bulletin introduces the material, lists its advantages, properties and instructions for use. The latter includes honeycomb preparation, melting the compound, filling storing and machining the honeycomb, removing the compound and handling precautions. *Rezolin, Inc.*

... FOR YOUR COPY, CIRCLE NO. 236

Steel Stock List and Reference Book

Catalog containing 224 pages of information on most every type of steel and aluminum in use; includes sizes in stock and necessary weights, dimensions and complete descriptive data. Also lists industrial plastics and machinery for metal fabricating including over 3,000 types and models of machinery and tools. Catalog is thumb-indexed for easy reference and pocket-size for convenient reference. *Joseph T. Ryerson & Son, Inc.*

... FOR YOUR COPY, CIRCLE NO. 237

Industrial Plastics

This 16-page booklet covers the properties and availabilities of line of industrial plastics for application selection. A chart details their properties including mechanical, thermal, electrical, chemical and miscellaneous. Presents data on a nylon pressured tubing and a recently introduced nylon braided pressure hose. Information is also included on sintered parts and molding powders, specialty nylon formulations. *Polymer Corp.*

... FOR YOUR COPY, CIRCLE NO. 238

New Concept in Cemented Carbides

Bulletin presents new material in cemented carbides which combines the advantages of conventional carbides with those of tool steels. Lists advantages, applications in dies, cutting tools and wear parts. Contains chart showing comparison of wear resistant materials in the new product to those of tool steel, cemented tungsten carbide and cast cobalt-base alloy. *Sintercast, Div. Chromalloy Corp.*

... FOR YOUR COPY, CIRCLE NO. 239

Refractory Metals Bulletin

Illustrated bulletin describes tantalum, titanium and zirconium and their advantages as materials of construction. Covers corrosion resistance feature of each metal, general fields of application and types of standard and custom equipment available. Points out that zirconium lined reactors, tantalum bayonet heaters, titanium shell and tube heat exchangers of several hundred sq. ft. heat transfer area are examples of commercial applications of these reactive metals. *Pfautler Co.*

... FOR YOUR COPY, CIRCLE NO. 240

Vacuum Melted Steels

Brochure describes new consumable vacuum melting furnace and the advantages it offers in the production of cleaner, stronger, and more heat and fatigue resistant metals. Listed also, are typical grades of alloy steels in production. *Vanadium-Alloys Steel Co.*

... FOR YOUR COPY, CIRCLE NO. 241

Finishing Steel With Coated Abrasives

Booklet gives a pictorial as well as verbal story of a line of coated abrasives used for the finishing of stainless steel. Included are descriptions of the flat polishing of stainless steel, the flat polishing of carbon steel, weld grinding and blending, and finishing fabricated steel. The booklet contains a chart as a guide to the development of a No. 4, No. 6 and finer finishes. *Minnesota Mining & Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 242

Resin-Bitumen Coatings

Preliminary information sheet on a resin-bitumen coating with qualities that make it useful as a one-coat inexpensive maintenance finish. Suggested for use as an internal or external pipe coating, as a coating for off shore drilling rigs, and for service in any area subject to corrosive chemical fumes and spillage. Table and photos show resistance properties to water, sodium hypochlorite and caustic soda. *Shell Chemical Corp., Plastics & Resins Div.*

... FOR YOUR COPY, CIRCLE NO. 243

Architectural Applications of Stainless Steel

Booklet devoted to types of stainless steel for architectural purposes covers resistance to corrosion, fabrication and versatile uses. Illustrates utilization of colored and textured stainless steel curtain wall including miscellaneous applications of the material as an exterior lockset, for sign making, railings, door hinges and reversible windows. Covers forms, regular and copper steel galvanized sheets and electro applications. *Republic Steel Corp.*

... FOR YOUR COPY, CIRCLE NO. 244

Wood Particle Board

Processing information and economic data on wood particle products are contained in this 16-page booklet. Covers particle board research, testing and evaluation. Photographs illustrate storage, screening, weighing, mixing and manufacturing of the material. Booklet also gives visual examples of dimensioning, water absorption tests, density and gravity tests. *Reichhold Chemicals, Inc.*

... FOR YOUR COPY, CIRCLE NO. 245

Precision Ground Tool Steel

Bulletin covers a complete line of precision ground tool steel and low carbon ground flat stock. Discusses oil hardening precision ground tool steel, its properties, hardness range, tolerances and sizes. Describes features of the firm's air hardening precision ground tool steel for free machining, its uses and properties. Eight features of a low carbon ground flat stock are also listed and include a typical analysis, tolerances and heat treatment. *Brown & Sharp Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 246

Mechanical Seamless Steel Tubing

Bulletin describes mechanical and aircraft mechanical seamless steel tubing setting forth minimum and maximum size ranges including shapes and variations from standard practices. Covers electric resistance welded mechanical steel tubing, size range for round, square and rectangular tubing, other shapes and tolerances. Outlines firm's fabricating and forging facilities. *Ohio Seamless Tube Div. of Copperweld Steel Co.*

... FOR YOUR COPY, CIRCLE NO. 247

Porcelain Enameling of Aluminum

Attractively designed guidebook on the application of porcelain enamels to aluminum. The 22-page book, which contains several illustrations in color, covers alloy selection, metal preparation, choice of frit, slip formulation, enamel application and firing. In addition, the book compares the advantage of porcelain enameled aluminum to those of porcelain enameled steel. *Reynolds Metals Co.*

... FOR YOUR COPY, CIRCLE NO. 248

Carbide Products Manual

How to use and specify carbides and the technology of carbides are covered in this catalog of carbide products. Includes technical data on throwaway insert blanks and standard blanks along with treatise on getting maximum economy from preformed carbide parts. A section is devoted to insert tooling and another to brazed tools. Trouble shooting chart shows major causes of carbide tool failures, causes and remedies. *Valenite Metals, Div. Valeron Corp.*

... FOR YOUR COPY, CIRCLE NO. 249

Plastics Table of Properties

Table shows significant physical, electrical, chemical and optical properties of nine thermoplastic materials including acrylics, acetate, butyrate, nylon, polyethylene and vinyls. Properties shown include: tensile, impact, flexural and compressive strength; resistance to sunlight, water, acids and alkalies; dielectric strengths and constants; machining and thermal qualities. Table is reprinted from *Modern Plastics Ency. Cadillac Plastic & Chemical Co.*

... FOR YOUR COPY, CIRCLE NO. 250

Specialty Chemicals

Booklet of interest to all fields in which starches, dextrine's, processed water-soluble gums, adhesives, and other specialty chemicals are used. Illustrated, the booklet lists the industries and manufactured goods where the products are used, gives the origin of the raw materials and offers concise descriptions of the processed starches, gums, adhesives and vinyls. *Morningstar-Paisley, Inc.*

... FOR YOUR COPY, CIRCLE NO. 251

New Aluminum Alloy Anode

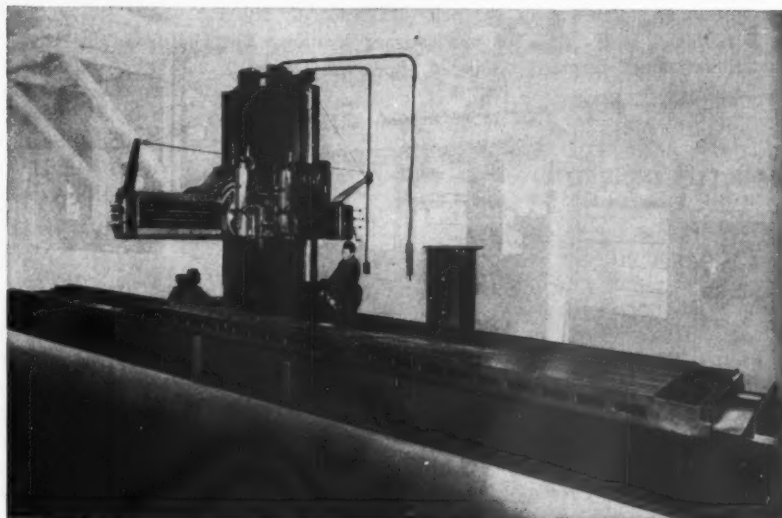
Three extra benefits of a newly developed aluminum alloy anode are outlined in this brochure which introduces this new cathodic protection to ships, docks, pipelines and other buried and submerged metal structures, as an improved modification of an earlier aluminum 5% zinc alloy anode. Explains why aluminum, the story behind the new development, features, advantages and a comparison of electro-chemical properties. *Electro Rust-Proofing Corp.*

... FOR YOUR COPY, CIRCLE NO. 252

MOORE FACILITIES

Giant Planer Cuts Machining Cost

Cut costs! Speed production! Moore does both with a heavy duty openside planer. It's part of the all-inclusive machining facilities at Moore which emphasize use of special and heavy duty tools, such as large vertical and horizontal boring mills, lathes, grinders, and many others. Let your machining job benefit from Moore's 50 years of experience. Consult Moore...for one-stop, one-shop machining requirements.



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WESTERN INDUSTRY/MARCH 1960

... for more details, circle No. 26 on Reader Service Postcard



NEW EQUIPMENT

FOR WESTERN PLANT OPERATION, PRODUCTION AND MAINTENANCE



USE RIP OUT POSTCARD, PAGE 57, FOR MORE INFORMATION ON PRODUCTS DESCRIBED

NEW TYPE MAGNETRON

...for use in radar system can improve safety

Extremely short pulses of only 0.02 microsecond, with peak power output of more than 25 kw, extremely small size and weight (4.2 lb.) are the features of this new type magnetron designed for service as a pulsed oscillator at a fixed frequency in the K-band between 34,512 and 35,208 Mc. Especially suited for use in high definition, short range radar systems of up to 5 miles, the new magnetron makes possible a radar system that will have a resolution of about 4.5 yd.



in range, and with proper antenna design, a display sharp enough to track people walking or clearly outline airplane and ship shapes. *Amperex Electronic Corp.*

... FOR MORE DETAILS, CIRCLE NO. 300

STEEL CONVEYOR BELTS

...now available in widths to 48 in.

New wide conveyor belts have been provided primarily to fulfill increasing requirements of the chemical and food processing industries for wider one-piece belts. Available in carbon or stainless steel, the belts are especially trued and flattened at the mill for conveyor application. The maximum width formerly available was 32-in. *Sandvik Steel, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 301

BALL TYPE INDICATOR

...if flow stops, the ball drops out of sight

Designed for flows down to 0.075 gpm. of water and 1/2 cfm. of air or gas, this simple indicator shows at a glance whether flow is taking place. Clearly visible from a distance, even in bad light, the flow makes the ball dance in the toughened glass dome. Useful in applications such as air, steam, water, and oil purge lines to instruments and mechanical seals; cooling water to compressors, condensers, jacketed process vessels, lab and



electronic equipment; lubricating oil to bearings and others. *McIntosh Equip. Corp.*

... FOR MORE DETAILS, CIRCLE NO. 302

SURFACE RAMP

...new series features heavy-duty, all-grating surface

New open grating ramp is self-cleaning; designed to permanently eliminate build-up of snow, ice, mud, oil or grease, and to provide a safe, clean, all-weather traction surface. The grating surface, a patented feature, extends from curb to curb throughout entire length of traction area. Serrated tracks are set into the grating surface to provide positive wheel traction, and are available in varying tread widths to meet power equipment requirements. The ramps are made of lightweight magnesium for one-man handling and are available in two widths, 58-in. and 70-in., and in 30x36 ft. lengths. Ramp capacities range from 7,000 to 20,000 lb. or more when required. *Magline Inc.*

... FOR MORE DETAILS, CIRCLE NO. 303

RUBBER SUCTION HOSE

...reinforced with a spiral of high density polyethylene

Designed for use in industrial applications where dust and gas tend to create an explosive situation. Virtually kink-proof, both the core and coil are wrapped with an outside layer of abrasion-resistant rubber. The spiral of high density polyethylene is resistant to rigors of temperature extremes—heat and cold—resists action of corrosive chemicals, and has exceptional tensile and impact strength. Available in sizes through 3-in. in diameter.

Polymer Chemicals Div., W. R. Grace & Co.

... FOR MORE DETAILS, CIRCLE NO. 304



MULTIPLE DIE PRESS

...for high speed cap production, 100 to 125 strokes per minute

For large quantity production of screw caps, tape cans, shoe polish cans and similar items, a new multiple die press has been developed. An entire lithographed sheet of tin plate or aluminum can be fed to the multiple dies, producing 8, 10 or even more caps at each stroke. Operating speeds range from 100 to 125 strokes per minute. Built in two sizes, the smaller model can produce eight 48 or 53 mm caps at each stroke. The larger model produces ten 70 mm caps per stroke or a correspondingly lower number of larger size caps. *E. W. Bliss Co.*

... FOR MORE DETAILS, CIRCLE NO. 305

THREE UNIVERSAL MOTORS

...have pad type bases, weight 13 lbs.

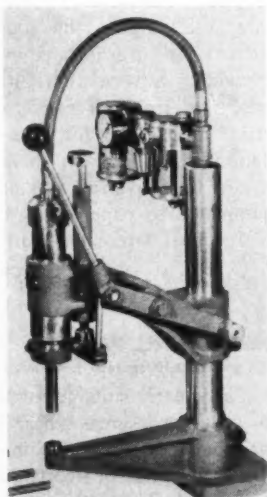
Three new standard stock models have been added to a line of series-wound universal motors. Originally designed to power automotive wheel balancing equipment, the three complete a line of 17 standard universals in the 1 to 1/50 hp. range. Their characteristics include high operating speed and starting torque, adaptability to speed control, and light weight per horsepower. Open continuous ratings of the three models are as follows: 1/2 hp. at 5,000 rpm.; 3/4 hp. at 7,500 rpm.; and 1 hp. at 10,000 rpm. Standard motors, built in aluminum housings, operate on 115 volts DC to 60 cycles AC and are non-reversible, rotating counter-clockwise at the commutator end. Cast iron housing, 230 volt operation, and reversibility are listed among the many mechanical and electrical modifications possible. Universal Motor Div., Robbins & Myers, Inc.

... FOR MORE DETAILS, CIRCLE NO. 305

PLANISHING MACHINE

...pneumatic, for sheet metal working

This machine will smooth out the wrinkles in mild steel up to 20 gauge thickness and will work to the center of an 18-in. circle. It is equally useful for riveting, staking, crimping, driving pins, inserting bearings and bushings. Operation is by foot pedal. Hammer valving is internal and is actuated by pressure of the tool on the work material. So long as contact pressure is maintained the hammer will repeat at from 2000 to 6000 times per minute with the rate varying according to the air pressure used. Machine is bench mounted. Heidrich-Nourse Co.



... FOR MORE DETAILS, CIRCLE NO. 307

INDICATING TRANSMITTER

...link and lever calibration, minimum of moving parts

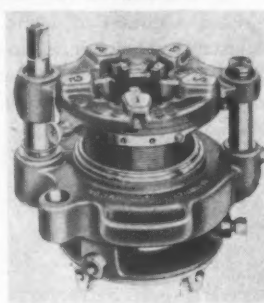
New line of pneumatic indicating transmitters for pressure, flow, temperature, liquid level, differential pressure, and dew point features measuring elements specifically designed for each major process variable. The transmitter is available with measuring elements in the following ranges: pressure, 0-10 in. water to 0-80,000 psi.; temperature, 450 F. to +1000 F. (-270C to +500C); flow (differential pressure), 0-1 to 0-400 in. water; liquid level, open vessels 0-10 in. water minimum. Closed vessels 0-20 in. water minimum; dew point, 50F to +165F. Output signal: 3-15 psi. (3-27 psi. optional). Operates on a 20 psi. air supply. The model has high ambient temperature stability, with less than 1/2% error for ambient temperature changes as great as 50F, regardless of the variable measured. Foxboro Co.

... FOR MORE DETAILS, CIRCLE NO. 308

JAM-PROOF THREADER

...pipe or conduit can be threaded without changing dies

With the introduction of a new jam-proof geared threader, 2 1/2-in. to 4-in. pipe and conduit can be threaded without changing dies. Threader adjusts quickly for straight or tapered, over and under size threads. The drive pinion kicks out automatically, preventing costly repairs and delays. Another time-saving feature of the threader is the new cam-action workholder which



sets exactly to size by easy turning of the adjusting collar. Ridge Tool Co.

... FOR MORE DETAILS, CIRCLE NO. 309

INDUSTRIAL FANS

...housed in steel, horizontal and vertical reinforcement

A new line of industrial fans to exhaust gases, corrosive fumes and for handling of granular or fibrous materials includes fans which are available in three blade shapes, a wide range of wheel and inlet sizes and five arrangements, designed to meet most industrial requirements.

The fans come in all AMCA standard wheel sizes from 19 1/2 to 64 3/4 in. with 11 inlet sizes from 11 to 37 in. All fans have AMCA certified ratings.

Air and gas fumes handling wheels in the new fan line have backwardly-inclined blades for top efficiency. For pneumatic conveyor systems, a granular materials handling wheel is available with straight blades. To permit easy movement of stringy or fibrous materials such as found in textile and woodworking mills, a straight wheel without a side plate is available.

The blades for materials handling fan wheels are designed to be repaired or replaced with common utility tools. Fan wheels are electronically balanced and fan shafts are machined to close tolerances. Heavy-duty ball bearings are standard in the line for long life under rugged operating conditions. Trane Co.

... FOR MORE DETAILS, CIRCLE NO. 310

CLEANING AND DEBURRING MACHINE

...for copper tubings and fittings, portable, economical

Precision built, this new machine will clean and deburr all size tubing up to 4-in. A 4-in. main brush, with adjustable guide, handles all external cleaning operations. For internal cleaning and deburring, three sizes of brushes and a rotary internal deburring tool work off the other end of the motor shaft under a clear plastic protective guard. Use of the machine eliminates hand work, insures tight connections,



prevents leaks and re-working operations. Is also useful for cleaning threaded fitting and internal threads of valves. Toledo Pipe Threading Machine Co.

... FOR MORE DETAILS, CIRCLE NO. 311

ADJUSTABLE FITTINGS

...make angle railing construction easier, faster

Four additions to a line of adjustable fittings include: adjustable cross, adjustable stair landing tee or cross, side outlet adjustable ell or tee, and double adjustable side outlet ell or tee. These fittings, made of high tensile non-corrosive aluminum alloy, swivel 180 deg. for use with stairway railings and angled braces and supports. Construction with the fittings involves no threading or welding, and pipe cutting is reduced to a minimum. All pipe fittings are salvageable. *Hollaender Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 312

FEED TUBING CUTTERS

...with fully enclosed feed screws to eliminate jamming

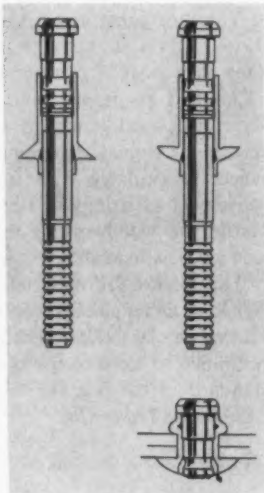
Two new tubing cutters give quick clean cuts of copper, brass, aluminum tubing and thin-wall conduit. Each tool carries a spare cutter wheel in the handle and a special cutter wheel for one model is available for cutting plastic and aluminum pipe. The cutters are made of lightweight, high-strength cast aluminum alloy. Grooved rollers give easy flare cut-offs without tubing waste, smooth tubing ready for soldering. Fold-in reamer is also handy. *Ridge Tool Co.*

... FOR MORE DETAILS, CIRCLE NO. 313

ALUMINUM BLIND RIVET

...a pin and a sleeve with integral locking

Line of monel mechanical lock-spindle self-plugging blind rivets has been expanded to include two aluminum alloy designs. The new aluminum fasteners are available in either protruding or countersunk head styles. The aluminum blind rivet is a two-piece factory-assembled design consisting of a pin and a sleeve with integral locking collar. During installation, the pin is mechanically locked in place within the sleeve by the locking collar which is automatically pressed into a conical space between pin and sleeve.



Huck Manufacturing Co.

... FOR MORE DETAILS, CIRCLE NO. 314

LIFT TRUCK ATTACHMENT

...handles tires without pallets, containers or banding

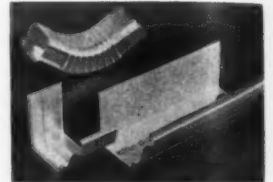
A new lift truck attachment that can handle passenger car, highway truck and industrial tires in quantity without the use of pallets, skid platforms, containers or the necessity of banding the load has been developed. A hydraulic rotating, clamp arrangement, the new attachment can handle a variety of tire sizes and quantities up to eight bulky truck tires at one time. Tires are held securely in the attachment through the pressure of opposed 65-in. long and 10½-in. wide steel pads. Range of the clamp is from 24-in. to 48-in. in width. *Yale & Towne Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 315

ALUMINUM BUILDING MATERIALS

...gutters and downspouts, foil insulation and nails

New aluminum gutters and downspouts feature an improved joint system using a sealing ribbon instead of the usual sealing compounds. The mastic ribbons are inserted into the slip-joints during installation providing a weathertight seal free from air pockets. The 36-in. wide foil insulation is available in three types: reflective foil asphalt laminated to paper on one side, foil laminated both



sides, and one side breather-type. Nine more types of aluminum nails have been introduced for exterior construction. *Kaiser Aluminum & Chemical Corp.*

... FOR MORE DETAILS, CIRCLE NO. 316

METAL WALL PANEL

...acoustically-treated, prefabricated, flush-type

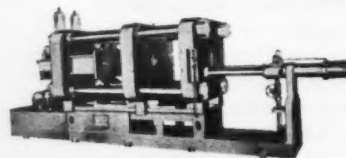
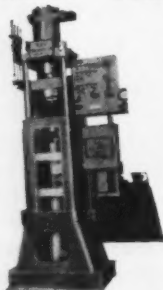
Particularly suitable for use as an interior dividing wall or partition in areas where noise reduction is required, the new panel is perforated on one side, and has a sound absorbing element of fiberglass between its two metal surfaces. Its rugged construction makes it ideal for industrial plants, commercial establishments, hangers and research facilities. Installation is fast, since it is made in 2-ft. wide sections. The panel also is made in 2 or 3-in. thicknesses with a choice of galvanized or cold rolled steel, primed with an oven-baked synthetic enamel. *R. C. Mahon Co.*

... FOR MORE DETAILS, CIRCLE NO. 317

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KUX TABLET PRESSES

Kux Presses are the accepted standard for high-speed automatic forming of tablets or parts from dry, powdered or granulated materials. Available in single or multiple punch models, mechanically or hydraulically operated, 50 to 600 ton capacity. Rugged construction enables these presses to meet the severe demands of continuous service. Special presses are also available for automatic sizing or coining.



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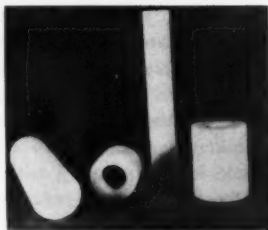
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WESTERN INDUSTRY/MARCH 1960

POLYPROPYLENE MOLDING

...available in rod, cylinder form for making prototypes

A complete line of polypropylene rod and cylinders, marking the first time that heavy semi-finished moldings of this material have been offered for user company application, has been announced. Ideal for elevated temperature (up to 240 deg. F.) and rigid construction service, Prototypes can be made of designs for in-plant or in-field testing, or for ultimate customer approval, prior to costly investment in production tool-



ing. The material can be easily machined, ground, drilled, threaded and welded, with standard woodworking or machine tools and equipment. *American Agile Co.*

... FOR MORE DETAILS, CIRCLE NO. 320

MOTOR CONTROL CENTERS

...with bus capacity from 200 to 2,000 amps

The centers, offering improved operation, easier maintenance and increased versatility over individual units are used to control electrical loads such as motors, lighting, welding and heating in industrial plants and commercial buildings. Available either as fusible or circuit breaker combination units, the control centers consist of two or more starters fed from a common bus and are often attached to transformers or switchgear to form a unit substation. Among features are reduced engineering and installation cost; savings in floor space up to 33%, and versatility of unit through plug-in design for easy movability. For voltages from 110 to 600. *Allis-Chalmers Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 321

MULTI-PURPOSE PRESSURE GAUGE

...made in 20 different standard ranges

This heavy-duty, geared-movement pressure gauge has been designed for a wide range of industrial applications. It is recommended for oil, air, water, steam, gas or any other media not corrosive to brass or bronze. Integral design of the socket, tube, tip, movement, pointer and dial assembly permits installation by hand-turning the gauge case and eliminates inaccuracies in pressure readings resulting from any distortion of piping. Gauge has a heavy-duty drawn steel case, a friction type snap-on ring that is beaded for lens protection and a double-gasketed lens. *Helicoid Gage Div., American Chain & Cable Co., Inc.*

... FOR MORE DETAILS, CIRCLE NO. 322

ATMOSPHERIC-PARTICLE MONITOR

...recordings are made on a 6-in. strip chart

New atmospheric-particle counting instrument has been designed for application to the continuous monitoring of outdoor air or atmosphere of indoor locations, such as ultra-clean work areas. It presents a permanent record of aerosols present in an overall range from 0.3 microns to any desired upper limit. This record is differentiated into 15 sub-ranges and recorded in sequence at intervals which can be predetermined in length. Stability problems are eliminated by the fact that the unit is continuously self-calibrated. *Royco Instruments Inc.*

... FOR MORE DETAILS, CIRCLE NO. 323



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Set the regulator to desired pressure . . . adjust the oil metering valve . . . and you are assured **3-way protection** for your pneumatic equipment. The dual-action filter is automatic.

1—REGULATES accurately—automatic bleed-off—serves as a shut-off valve—**reduces costly "set-up" time.**

2—FILTERS out dirt, scale and condensate — dual action — interchangeable filter cartridges — protects against damage due to dirty air — **less "down-time".**

3—LUBRICATES with a penetrating fog-like oily mist — reduces costly repairs and replacement of air tools — **controls costs.**

The easiest to install . . . small, compact and only 2 connections, "in" and "out". Available from stock in 1/4"-3/8"-1/2" and 3/4" NPT.

Write for Bulletin 30 describing our COMPLETE LINE of Air Control Devices.

PERFECTING SERVICE CO.

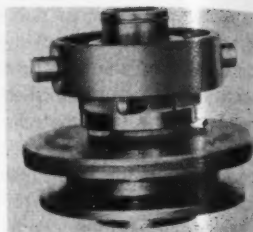
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New York - Providence - Montreal - Toronto - Hamilton, Canada

... for more details, circle No. 29 on Reader Service Postcard

SMALL DISC CLUTCH

... features single or double V-belt sheaves

Two new types disc clutches feature integral single or double V-belt sheaves mounted on double seal ball bearings, and are stocked in nominal sizes of 4 1/8, 4 3/4, and 5-in. for use with belts having pitch diameters from 3.4 to 4.6-in. Clutches are for heavy-duty service on keyed stub or through shafts from 5/8 to 1 1/4-in. in diameter, at speeds up to 4,000



rpm. Clutch is engaged and disengaged with a manual shift lever. Edgemont Machine Co.

... FOR MORE DETAILS, CIRCLE NO. 326

LOW PRESSURE AIR COMPRESSORS

... delivers 372 to 1430 cu. ft. of air per minute

New series of low pressure machines of type used in a number of applications by a wide range of manufacturing industries. They also provide power for materials handling equipment which pneumatically moves dry cement, lime, fly ash and similarly pulverized products. The three machines in the series are water-cooled, double acting, single-stage units featuring two cylinders of equal size. The compressors are equipped with pulsation dampers in place of standard-type intercoolers. Largest machine in the low pressure line delivers up to 1430 cfm. at 30 psi. when running at 475 rpm. and up to 1137 cfm. at 45 psi. when operating at 410 rpm. Atlas Copco Pacific, Inc.

... FOR MORE DETAILS, CIRCLE NO. 327

WATER-TO-AIR HEAT PUMP

... for automatic, clean heating or cooling comfort

An attractively styled heat pump that will provide year-round air conditioning for offices and stores has been introduced in five sizes from 3, 5, and 7 1/2 ton single compressor units to 10 and 15 ton dual compressor units. Heating capacities range from 49,000 to 206,000 Btu per hour. All moving parts are enclosed in an acoustically treated cabinet to suppress operating sounds. Both fan and compressor are resiliently mounted to absorb noise and vibration. Features include full range temperature controls, maximum heat transfer, rugged construction and easy maintenance and service. Trane Co.

... FOR MORE DETAILS, CIRCLE NO. 328

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WESTERN INDUSTRY/MARCH 1960

RAILROAD CAR SHAKEOUT

...anchored to ground, push-button controlled

New piece of material handling equipment is mounted in a fixed position alongside the railroad track where hopper cars, either open or covered, are to be unloaded. A powerful hydraulic cylinder exerting a force of 14 tons, pushes a vibrating head against the side of the car, which shakes the entire car and causes compacted or frozen material to loosen and flow down through the hoppers. No manhandling of a heavy suspended weight is required as with clamp-on shakeouts. The new unit weighs 2400 lb., has a 7½ hp. high-torque vibrator drive, and a 3 hp. high-torque pump drive. It is designed to meet the needs of operations requiring the unloading of one to 10 hopper cars per day of coal, aggregates, ores, and other materials. *Hewitt-Robins, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 329

HAND DISPENSER

...for extra wide roles of pressure sensitive tape

A new dispenser that will handle rolls of pressure sensitive tape in widths up to 3 in. has been introduced. The lightweight, easy to use hand dispenser is constructed of aluminum and features a special cut-off blade to shear through glass filament reinforced tape. Replacement of an empty roll takes seconds and involves only two moving parts. Many new and varied uses for pressure sensitive tape in widths up to 3 in. include railway freight and truck terminals where it is utilized to quickly and efficiently re-cooper damaged corrugated boxes, cartons, crates, kegs and wooden barrels. Also, extra wide tapes are utilized to seal holes in box cars and trucks used to haul grain, dry chemicals, or other bulk products. *A. J. Gerrard & Co.*

... FOR MORE DETAILS, CIRCLE NO. 330

SURFACE GRINDER

...cuts grinding time as much as 50%

New surface grinder in the 8x24-in. size features ease of operation and a substantial increase in table speed which reduces grinding time as much as 50% over similar sized machines. Maximum table traverse speed is 125 ft. per minute. In addition to reducing grinding time, the high maximum table, traverse speed helps to reduce burn, checking and cracking of the work. This advantage is particularly significant when grinding heat sensitive steels.

Another significant feature is the machine's capacity for grinding a workpiece as high as 13¾-in. under a standard 10-in. diameter grinding wheel. *Norton Co.*

... FOR MORE DETAILS, CIRCLE NO. 331

DUAL FOUR-PORT SELECTOR VALVE

...for use with chromatographic or other gas analyzer circuits

Simple 90 deg. rotation of a single handle actuates both valve components simultaneously and permits reversal of flow direction of two fluid systems through two alternate systems. It is also useful with precision test systems requiring simultaneous dual system control. In a typical application, the valve can be installed between the alternate columns in a chromatographic analyzer circuit where, by a 90 deg. rotation of the single handle, either column can be used while the other is being purged or backflushed. Plugging one port in either of the dual valves converts it to three-way operation. *Circle Seal Products Co., Inc.*

... FOR MORE DETAILS, CIRCLE NO. 332

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*U.S. Patent Nos. 2,833,567 and 2,731,279.
"super gem" is an Aeroquip Trademark.
Teflon is DuPont's trade name for its tetrafluoroethylene resin.

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Aeroquip Northwest Warehouse, 635 N.W. 16th Ave., Portland, Ore.

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

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PUSH-OFF DEVICE

... with side shifter and multiple forks

Designed and manufactured for establishments using a take-it or leave-it pallet system, this attachment is capable of handling the palletized unit loads in process and storage and also the non-palletized loads during shipment. When loading carriers, the multiple tined forks are slid between small stringers on top of the pallet and the load raised off; load is then moved to carrier and pushed off forks. *Lewis-Shepard Products, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 333

STEAM CLEANER

... delivers 10 gals. per hr. more cleaning solution

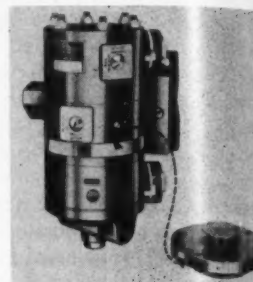
A new model cleaner produces 130 gallons of hot solution hourly, the extra capacity plus a newly designed orifice and nozzle increasing cleaning efficiency 20%. Remarkably compact, the oil-fired, caster-mounted new model measures 45-in. long, 21-in. wide, by 43-in. high, and weighs 565 lb. net. Tricycle and trailer mounts are optional. A gas-fired, stationary model is also available. All models are finished in gold with green trim. *Malsbary Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 334

PNEUMATIC CONTROLLERS

... which use metal bellows in the unbalance detector

Newly available metal bellows-type controllers are recommended for batch-type processes with frequent startups, and for installations where ambient temperature is variable. Lower minimum gain, reduced drift and hysteresis effects, and increased sensitivity are some of the advantages of the new controller. The new bellows-type models are offered with integral or remote set-point, for the following control modes: on-



off, adjustable proportional, proportional plus reset, fixed proportional plus reset, and proportional plus reset, plus derivative control. *Bristol Co.*

... FOR MORE DETAILS, CIRCLE NO. 335

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This all-purpose blind rivet will reduce your assembly costs because just one worker is needed and no back-up is required. Even hard-to-get-at area problems are solved because this light weight, easy-to-use hand tool inserts and sets the rivet from the same side. It is also available in a pneumatic production tool. These "POP" rivets are available in various metals and a wide range of sizes. Regardless of your current method of fastening, it will pay you to get the complete story from...



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WESTERN INDUSTRY/MARCH 1960



WESTERN INDUSTRY NEWS

THE INDUSTRIAL WEST . . . ON IT'S WAY

PLANTS • PRODUCTION • DISTRIBUTION • PERSONNEL

Studebaker-Packard Builds at Santa Ana

SANTA ANA, CALIF.—The CTL Div. of Studebaker-Packard Corp., Cincinnati, Ohio, plans to start operation in June, 1960, of a new plant being constructed on four acres of land here, according to *Elmer P. Warnken*, president of the division.

The new plant, for production of high temperature and structural plastic components for missiles and space vehicles being produced in the West, will be adjacent to Grand Ave. in Santa Ana and will be served by the Santa Fe Railway.

Warnken stated initially a plant of 20,000 sq. ft. will be in operation in June, and will employ up to 100 scientists, engineers and technicians before year end.

The CTL Div. of Studebaker-Packard was founded in Cincinnati in 1946 as the Cincinnati Testing and Research Laboratories. It became a division of Studebaker-Packard in 1959.

Big Electronics Center Planned by Bendix

NORTH HOLLYWOOD, CALIF.—Acquisition of an 80-acre site in the San Fernando Valley for a new electronics center was announced today by *R. C. Fuller*, vice president of Bendix Aviation Corp.

A 650,000-sq. ft. facility for the development of military and industrial electronic systems will eventually be constructed on the site by Bendix.

\$50 Million in Military Projects for California

WASHINGTON, D. C. — A \$50,000,000 construction program for Army, Navy and Air Force installations in California was revealed in the Defense Dept.'s annual request to Congress for building funds recently. Under the program California will get more money than any other state.

BLISS AND LAUGHLIN CELEBRATE RECENT MERGER WITH SIERRA DRAWN STEEL CORP.



During an informal luncheon celebrating merger of Sierra Drawn Steel Corp. with Bliss & Laughlin, Inc., B&L President Arthur Lehr, left, chats with guest H. H. Fuller, vice president, Bethlehem Steel Co., as Fred Robbins, right, former head of Sierra Drawn looks on.

LOS ANGELES—Amid predictions of doubled output within 10 years, Bliss & Laughlin, Inc., Harvey, Ill., officially entered the West Coast business complex last month by merger with Sierra Drawn Steel Corp., for 14 years a major Western producer of cold-finished steel bars.

The merger was announced jointly

by *Arthur Lehr*, president of Bliss & Laughlin, and *Fred J. Robbins*, new Western vice president of B&L and former head of Sierra Drawn Steel. Acquisition of the firm was based on a \$1,250,000 exchange of stock.

Representing B&L during merger ceremonies were *Eugene G. Sheasby*, vice president, sales; *Richard K. Klink*, secretary-treasurer; and *Arnold Kalman*, member of the board.

The meeting was followed by a luncheon hosted by Robbins at the Jonathan Club here, with some 50 steel executives and public officials attending.

Sierra's cold finishing facilities in Los Angeles and Seattle, Wash., will be operated as a division of B and L. There will be no management changes, but Lehr stated that Sierra operations are planned for expansion and that property will be purchased for a high capacity cold finishing mill. This will supplant a currently leased facility at 5821 E. Randolph St., here.

Kalama Selected for Dow Phenol Plant

KALAMA, WASH.—*Leland A. Doan*, general manager of Dow Chemical's Western division, has announced plans to build a Pacific Northwest phenol plant here in Cowlitz County on a 150-acre Columbia River site.

Principal considerations in site selection were deep water shipping facilities, excellent highway and rail transportation and proximity to growing regional markets, Doan said.

Cost was estimated at between \$4,000,000 and \$5,000,000. Plans call for completion of the plant in mid-

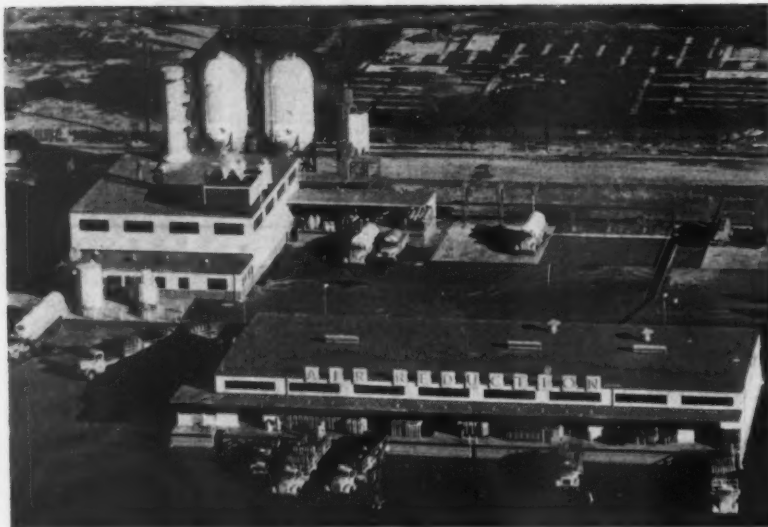
1961. The facility will have a capacity of 36,000,000 lbs. a year and will employ 250 persons within two years.

\$21 Million Expansion For Utah Oil Refining

SALT LAKE CITY—Utah Oil Refining Co.'s sales representatives from Utah, Idaho, Nevada, Oregon and Washington heard *A. J. Badger*, president, announce a \$21,000,000 capital expenditure program to expand the firm's manufacturing and marketing facilities.

Of \$4,319,000 to be spent this year, \$1,540,000 is allocated for the manufacturing division.

NEW AIR SEPARATION PLANT AT RICHMOND



TOP: Overall view of new air separation plant of Air Reduction Pacific Co., a division of Air Reduction Co., Inc., at 731 West Cutting Blvd., Richmond, Calif., which with its supporting facilities cost approximately \$3,000,000.

RIGHT: Present at the March 3 dedication were San Francisco District staff members, left to right, first row, Glenn Tangren, supt. Richmond plant; L. A. Hamilton, vice pres.; F. A. Pettersen, distribution supt.; top row, G. G. Drake, sales manager; J. B. Tanner, sales office manager, all of the San Francisco dist.; and B. W. Whaley, supt. of acetylene plant, Berkeley, Calif.



RICHMOND, CALIF.—A Bay Area plant which has no raw material problems and stores its products between 297 and 320 degrees below zero was dedicated here March 3.

John A. Hill, president of Air Reduction Co., Inc., New York, was present and pressed the button which placed the plant officially in operation. H. P. Etter, president, Air Reduction Pacific Co., L. W. Hamilton, vice president, ARPC, joined in the ceremonies.

Located on 10½ acres at the intersection of West Cutting and Canal Blvds., the plant has 26,000 sq. ft. of floor space. The plant can produce in excess of 30 tons of liquid oxygen, nitrogen and argon in a 24-hr. period and is so designed that up to three more comparable units can be added in the future.

The plant includes a compressing-liquifying unit with storage towers and bulk loading facilities; a cylinder filling building where cylinders are filled under pressure with the various gases for delivery to users; a separate unit for storage and delivery of hydrogen

and acetylene cylinders; a garage and automotive service unit. About 100 persons are employed at the plant at its present size.

Air Reduction Co. Inc. has several hundred sales, warehouse and plant facilities in the nation; 15 plants on the Pacific Coast and now five plants in the Bay region.

Hathaway Organizes Special Products Div.

DENVER—Hathaway Instruments, Inc., has organized a new special products division to develop, design and manufacture transistorized inverters and converters and special purpose electronic filters.

Roger H. Mason, former assistant general manager of Hermetic Seal Transformer Co., Garland, Tex., has been named manager of the new division.

Component parts for the Thor inertial guidance system and for constant speed jet engine drives are currently being manufactured in the firm's \$1 million plant at 5800 E. Jewell Ave., opened in June, 1957.

Moore Business Forms To Build at Sunnyvale

SUNNYVALE, CALIF.—Moore Business Forms, Inc., broke ground recently on their new 38,000 sq. ft. plant on Kifer Rd., here. The modern building will replace the present plant in Los Gatos built in 1956. Representing a \$1,000,000 investment, the plant is located on a 5-acre plot. Expected to double in size within five years, it will ultimately employ approximately 140 people.

A. L. Fletcher, plant manager, announced that, "Sunnyvale was selected as the new plant site after a careful survey of all possible areas. We feel Sunnyvale offers the advantages of space, location, and industrial convenience we have been seeking in this expansion move." The firm manufactures multiple part business forms.

New West Coast Site For General Aniline

SAN FRANCISCO—General Aniline & Film Corp. has announced that it will build a new West Coast branch sales office and distribution center in South San Francisco. The building is scheduled for completion July 15.

The new facility, which will have 45,000 sq. ft. of floor space, will be a consolidated sales office and warehouse for the corporation's three main divisions: Ansco, Ozalid, and Dye-stuff & Chemical, to serve Western and Northwestern states.

The decision by General Aniline & Film to locate in South San Francisco was predicated on an economic survey by the Austin Co. Austin's Western District has designed and will build the facility, which will be located in the Utah Construction & Mining Co.'s industrial tract.

Smucker To Construct Plant at Salinas

SALINAS, CALIF.—To expand its marketing activities in the West Coast area, the J. M. Smucker Co., producer of preserves and jellies, is building a \$1,000,000 plant and warehouse here.

Location of the new 65,000 sq. ft. facility will be on a 12-acre site at the southerly city limits on U.S. Route 101. The plant will be equipped with the latest bulk sugar conveyors, fast vacuum cooking kettles, special machinery for cleaning, filling and labeling jars, and packaging and storage facilities.

Oregon Plywood Firm Adds New Equipment

ASTORIA, ORE.—The Astoria Plywood Corp. has entered into a leasing arrangement which will provide \$450,000 worth of equipment to modernize its plant, according to *Fred Peirson*, manager of the cooperative corporation.

A leasing arrangement has been signed with the U. S. Leasing Corp. of San Francisco, Peirson said. The company also is investing between \$250,000 and \$300,000 of its own profits in new equipment during 1959 and 1960, he added.

It is expected the equipment will be installed by June 1, completing the first step in a long-range expansion program. The additional equipment will increase production capacity from the present 4,000,000 ft. of plywood a month to about 5,000,000 ft. a month.

Pacific Power & Light Co. is working with Astoria Plywood for a new power distribution system in the plant. A contract for this work is expected to be awarded in the near future.

Prefab Material Plant Underway

TUCSON—A plant for the manufacture of parts for prefabricated homes, expected to employ 300 to 400 persons in two years, is now under construction in the Vail area east of here, according to *L. E. Steele*, president of Construction Components, Inc.

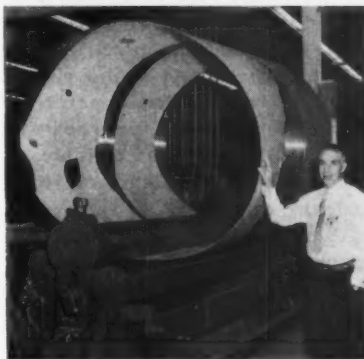
Target date for completion is April, with some 800 houses to be produced the first year, he said. Investment for land, building and equipment will be \$480,000.

The prefabricated materials will be sold to builders throughout the Southwest from Texas to Southern California.

Power Transmission Grid

CEDAR CITY, UTAH—Plans for a \$93 million electric power transmission grid in Utah, Arizona, Colorado, New Mexico and Wyoming utilizing power from Glen Canyon Dam have been announced by *E. M. Naughton*, president of the Utah Power and Light Co. and Telluride Power Co. First step in the project is the proposed \$23 million 230,000 kw transmission line from Salt Lake City to Flagstaff, Ariz., a distance of 455 miles.

AIRLINE WELDING OCCUPIES NEW FACILITY



Top: Stock shot of plant building.
Bottom: Planishing techniques involved in fabrication of stainless steel sugar processing equipment are explained by Byron R. Russell during recent Airline Welding open house.

GARDENA, CALIF. — After two years of planning, Airline Welding and Engineering has occupied a new \$313,000 facility at 15899 S. San Pedro St., here, that has 38,000 sq. ft. of fabrication area and a materials handling system featuring a 70-ft. overhead crane system with 200 ft. of travel.

Denver Metals Broadens Field

DENVER—The Denver Metals & Chemical Corp., through its Rocky Mountain Fiberglass Div., has entered the plumbing products field with a new line of reinforced plastic bathroom fixtures under the trade name of "Fibersheen."

The division manufactures products and surfaces of sprayed fiberglass and resin laminate.

Hamilton S. Gress, president of Denver Metals & Chemical, said the new line consisted initially of shower stalls and receptors, bathtubs and lavatory-vanities, designed for home as well as institutional use.

The firm, established in 1952 by *Byron R. Russell* as a one-man shop, last year grossed \$1.5 million. In addition to contract work done in the sheet metal and fabrication shops, the firm turned out 200 custom welding machines. They specialize in manufacture of longitudinal welding positioners, roll planishing equipment and other weldment processing items.

A two-story front section of the building devotes 8,000 sq. ft. to administrative and sales activity. A welding research and development laboratory is currently under construction in the southwest corner of the plant.

Here welding equipment and weld processing machinery will be designed and techniques studied for welding new exotic metals and alloys.

Typical of contract parts produced at Airline are precision items with fabrication tolerances to .001-in., pressure vessels, high speed pumps, air-frame ducting systems, missile nose cones and perforated metal structures.

White Onyx For Cast Building Stone

SALT LAKE CITY—Utah Calcium Co. has put into operation a \$150,000 plant and mine near Delle, Tooele County, in commercial "rediscovery" of white, carbonate onyx.

G. E. Roberts, vice president and sales manager, said since the 1920s, as a source of calcium carbonate needed by poultry and livestock, the operation proved reasonably profitable for 30 years.

However, Utah Calcium, aiming at much larger markets, started the 600-ton-a-day grinding, sizing and bagging plant to furnish white onyx to producers of cast building stone.

GEARS FOR INDUSTRY
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OIL FIELD PUMPING UNITS

Did You Know . . .

that, the town of Lufkin, Texas, besides being world famous for coon hunting, and cooking, southern style, is also the home of Lufkin Gears for Industry, Oil-field Pumping Units, and Heavy Duty Truck Trailers?



V. J. Fawcett

that, the town is nestled among the tall pine trees of East Texas, where forests thrive and grow 5 times faster than in other parts of the U.S.? Heavy rainfall and warm temperatures make it so.

that, the great southern paper industry utilizing southern pine, long leaf and loblolly pine, began in Lufkin, Texas—home of the Southland Paper Mills, back in 1937? E. L. Kurth, Board Chairman of Lufkin Foundry and Machine, is President of Southland, and to Mr. Kurth goes the credit for pioneering this vast industry from its infancy. Modestly, however, he would be the last to claim such recognition.

that, Lufkin Oilfield Pumping Units have earned worldwide recognition for performance, dependability, and long life?

that, Lufkin Gears for Industry are fast gaining prominence in the fields of refining, pipelining, marine propulsion, aircraft ground support, and yes, even outer space?

But it's not all sweatin' and straining at Lufkin—the folks there are easy goin' and find time to go cat fishing, coon hunting, squirrel and crap shooting, and sometimes, go in for just plain loafing.

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70

Timber Products Plans Expansion

MEDFORD, ORE. — Timber Products Co., Medford, plans a \$750,000 expansion and modernization program for its wood products.

A large segment of the project will be steam generating facilities for both the lumber and plywood divisions.

The unit is to have automatic stoking and automatically-controlled forced and induced draft air systems. Cinder collectors and reinjectors will be installed to reduce smoke and air pollution.

Cost is estimated at \$500,000.

A 24-opening hot press is to produce plywood. The installation is expected to cost more than \$100,000.

A semi-automatic panel patching and handling system is also planned for the firm's plywood operation. Veneer dryers will be equipped with automatic continuous moisture recorders for closer control of veneer moisture content.

A research and development program is underway to find uses for products now classed as waste.

Burgess-Manning Names Western Representatives

OAKLAND, CALIF. — The Burgess-Manning Co., Industrial Silencer Div., engineers and manufacturers of a broad line of standard and special intake and exhaust silencers for internal combustion engines, compressors, blowers and turbines, has appointed the Barth Engineering Co., 3871 Piedmont Ave., here, sales representative for the Northern part of California and Nevada except Clark County.

Sales in the mountain states of Colorado, Utah, Wyoming, Montana and Idaho will be handled by E. N. Murray Co., 518 Seventeenth St., Denver.

Pyle National Opens Denver Branch Office

DENVER, COLO. — The Pyle National Co., Chicago, manufacturers of "hazardous location equipment," has occupied its new branch office at 801 West 5th Ave., with Robert Emich as Denver office manager.

The firm is the prime supplier of electrical connectors in the petroleum and missile fields, Emich said. Their connectors are now being used in the Atlas and the Minuteman missiles. The Denver branch will service Colorado, Wyoming, Idaho, Utah and Montana.

Harvey Hubbell's New LA Branch Quarters



LOS ANGELES — Harvey Hubbell, Inc., manufacturer of electrical wiring devices and machine screws, has opened a new branch warehouse and office at 121 W. Elmyra St., telephone CA 3-1167. The 11,280 sq. ft. building is designed for future expansion and currently serves distributors in Southern California, Nevada, Arizona and New Mexico. The warehouse, that opens onto three loading docks, is equipped for rapid handling of out-of-town shipments as well as local pickups. A. M. McMillan, Western manager, is in charge of the new facility.

Invar and Digital Laboratories Merge

CULVER CITY, CALIF. — Telemeter Magnetics here has announced merger of two of its subsidiaries, Invar Electronics Corp. and Digital Instrument Laboratories. Both firms are engaged in the development and manufacture of instruments and solid state power supplies used in the computer, automatic control, and instrumentation industries.

The consolidated organization, to be known as Invar Electronics Corp., will be headed by Ted Kopaczek, president; Richard Lavine, vice president; and Carl Greiner, controller.

Combined operations are located at 323 Washington Blvd. in Pasadena. The parent company is engaged in development and manufacture of magnetic core memory products.

Sanford Process Co. Announces Licensee

LOS ANGELES — Technical Metal Finishing Co., Glendale, Calif., has been licensed by Sanford Process Co., Inc., here, for that company's aluminum hard coating process, John Franklin, Sanford's vice-president and general manager, has announced.

New Plant Underway For Eldon & Ungar

LOS ANGELES—Construction is under way for a new 210,000 sq. ft. manufacturing plant to merge facilities and resources of Eldon Mfg. Co. and Ungar Electric Tools. The plant is to be located on an 11-acre site in Hawthorne, a suburb of Los Angeles.

Eldon makes industrial plastic products, while Ungar Electric Tools, electronic division of Eldon, manufactures soldering tools and accessories. The new plant will consolidate in one facility operations now being conducted in seven separate plants.

The building is laid out to provide for conveyorized material handling including unloading raw plastics from freight cars by the air suction method. According to President *Robert Silverstein*, an electronic brain will be used for production, inventory and cost control.

Foxboro Opens Two New Branch Offices

PORTLAND—Terminating its former sales representative arrangement in the Northwest, The Foxboro Co., Foxboro, Mass., manufacturers of industrial instrumentation, has opened two new branch offices, one here and the other in Seattle.

The local office is staffed by *F. J. Renner*, branch manager; *L. E. Schlabach*, sales engineer; and *W. C. Kenzler*, service engineer. Serving the Seattle area are *I. D. Hummel*, branch manager; *D. O. Nielsen*, sales engineer; *C. L. Liakos*, office engineer; and *W. E. Talbert*, service engineer. Foxboro also maintains a regional office, branch factory and warehouse at San Leandro, Calif.

New Research Div. For Servomechanisms

HAWTHORNE, CALIF.—*William W. Shannon*, President, Servomechanisms, Inc., announced expansion of the corporation's research plans and programs, and the formation of a separate research division.

Ralph F. Redemske, Vice President, research, disclosed the move as a result of Servomechanisms' growing research and development accomplishments. Headquarters for the research division will be at the company's Santa Barbara facility.

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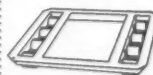
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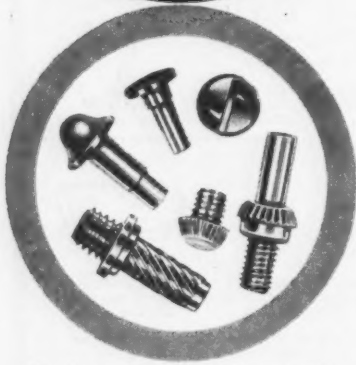
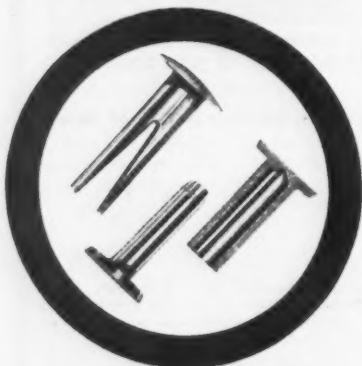
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United Research Corp. Receives New Name

MENLO PARK, CALIF. — United Research Corp. here has changed its name to United Technology Corp., according to an announcement by Lt. General Donald L. Putt, USAF, (Ret), president.

Gen. Putt said the name change was made primarily because the word technology describes in a much more definitive manner the work and scope of activities the company is undertaking. Secondary considerations involved the location of the firm's permanent headquarters which will be in Sunnyvale, Calif. plus the fact that other companies bearing names similar to United Research Corp. had been encountered. United Technology Corp. is a wholly owned subsidiary of the United Aircraft Corp. and was organized to carry out research and development in the fields of solid and liquid propellants, rockets and advanced propulsion systems.

The company has two multi-million dollar space age facilities under construction. A Research and Engineering Center is being built on a 25-acre site in Sunnyvale, and a Development and Test Center is under construction on a 3200-acre piece of land some 10-miles southeast of San Jose, Calif.

New Oregon Firm To Make Poletop Switches

OSWEGO, ORE. — Clackamas County's newest industrial plant, Powerdyne, Inc., opened its doors recently at 17150 S. W. Boones Ferry Road, here. The wholly owned corporation, formed in January by three Oregon engineers, will manufacture poletop switches for use by private and public power systems in distribution and transmission. Powerdyne is planning a current monthly production of 100 complete switches.

Powerdyne occupies a 4,000-sq. ft. pumice-stone building. The \$20,000 structure contains \$10,000 worth of lathe, punch-press, welding, grinding, and pipe-bending equipment, to be operated by a staff of eight.

One of only three such switch-producing operations in America, Powerdyne was founded by Henry H. Schwager, president, of Portland; Charles E. Kerr, secretary, of Hillsboro, and Clarence C. Bragg, treasurer, of Oswego.

Babcock & Wilcox Boiler Div. Opens Denver Office

DENVER — March 1 a Boiler Div. district sales office of the Babcock & Wilcox Co. was opened here with recently appointed Robert L. Swinney as Denver District sales manager.

The new facility, located at 1700 Broadway, has taken over steam generating equipment sales and service activities which were relinquished by the Stearns-Roger Mfg. Co. on termination of its sales agency agreement with the division on March 1.



R. L. Swinney

Swinney, formerly sales engineer with Babcock & Wilcox in Chicago, will be responsible for Boiler Div. sales district comprising Colorado, Montana, New Mexico, Utah and Wyoming, and certain portions of Idaho, Nebraska, Nevada, So. Dakota and Texas.

Colorado Uranium Plant To Be Expanded

CANON CITY, COLO. — Work is already underway to expand the Cotter Corp.'s pilot plant here to a full scale uranium processing plant. The plant's daily rated capacity will be increased from 72 tons per day to approximately 200 tons per day.

Estimated cost of the addition is in excess of \$1,000,000. The plant was designed by the Western-Knapp Engineering Co. of San Francisco, Western-Knapp is also doing the construction work.

The 48 man force now operating the mill will be increased to approximately 60 as soon as the addition is complete. Glen Hanson is mill superintendent for the Cotter Corp.

Pacific Automation Adds Architect-Engineering Div.

GLENDALE, CALIF. — Industrial Plastics & Chemicals, here, has been appointed Northern California distributor by Hastings Plastics, Inc., Santa Monica plastics materials supplier.

James F. Rae, general manager of Industrial Plastics, will direct distribution of the Hastings line, including specialized resin formulations and plastic shop supply items.

... for more details, circle No. 38

Gladding, McBean Leases Plant for Expansion

LOS ANGELES — Gladding, McBean & Co. has leased a 15,000 sq. ft. plant at 1551 South Primrose St., Monrovia for an expansion of its newly formed technical ceramics division. Frank C. Arrance, general manager, anticipates about 60 people will be employed in this highly automated production facility by the end of 1960.

The firm is in full production on ceramic nose cones for the Sparrow III guided missile and is working on Atomic Energy Commission contracts for nuclear fuel elements, ceramic torii for the hydrogen fusion process, ceramic waste containers and other special ceramic items for the nuclear energy field.

20,000 Ton Capacity Cast Stone Plant

SALT LAKE CITY — Construction of a \$65,000 plant in Murray to furnish onyx, agate and quartz chips to meet growing demand for cast stone for building construction, was announced recently by officers of the newly organized Skyline Supply Co.

The plant will have a capacity of 20,000 tons, employing about 15 workmen initially. The new industry is an outgrowth of Skyline Chemical & Supply Co., which has been marketing dry colors for several years to cast stone and concrete products manufacturers.

Skyline Supply will operate the Murray plant and the quartz quarry in Box Elder County. Skyline Chemical Co. will distribute a broad line of industrial equipment and supplies.

Hevi-Duty Electric Co. Names Two Western Reps

DENVER — The Clyde P. Elliott Co., 661 Delaware St., here, has been appointed as a representative of the Transformer Div. of the Hevi-Duty Electric Co., a Div. of Basic Products Corp., in the Colorado-Wyoming area. The firm will handle the sale of power, distribution and control transformers.

To cover the Utah area, Douglas E. Bolton & Associates, P.O. Box 79, Sugarhouse Station, Salt Lake City, have been named. Hevi-Duty headquarters are located in Milwaukee, Wisc.

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3-A-2

Leach Acquires Electrospace Labs

PASADENA, CALIF. — Acquisition of Electrospace Laboratories, Inc., a leader in the development of subminiature solid-state command receivers for missiles and other space vehicles, was announced recently by Leach Corp., of Compton, Calif.

The move marked the third purchase of an electronic firm by Leach within a year and entry of this space component and systems manufacturer into the field of radio-frequency communication equipment. This particular electronic product area was selected, executives said, to supplement existing Leach talent in the signal-conditioning, and data storage and processing areas, to create a complete telemetry system capability.

Electrospace and its key personnel are being integrated into the main Leach development and manufacturing facility at Compton, and will be known as the Communications Div.

Union Oil Develops 22 Drilling Sites

LOS ANGELES—Union Oil Co. has announced it will begin immediate development of 22 drilling sites on its extensive Stearns mineral fee properties in the Orange County section of the Los Angeles Basin.

Company officials said the program is not being undertaken at this time because of the need for oil but because of the rapid encroachment of home and industrial development in the area.

Lockheed To Acquire Colby Steel, Colby Crane

SEATTLE — In a move to strengthen and broaden its industrial base Lockheed recently announced an agreement to acquire Colby Steel & Mfg., Inc., here, and Colby Crane & Mfg., Ltd., of Vancouver, B. C.

Colby Steel and Colby Crane annually produce cranes, elevators, hoists and other materials handling equipment valued at approximately \$2,000,000.

New Precision Tool Plant

CENTERVILLE, UTAH — Barber Tool & Manufacturing Co. has broken ground for construction of a precision tool and parts manufacturing plant here to supply the missile industry, said Gordon J. Barber, owner.

Tucson Firm Adds Mineral Plastics Div.

TUCSON — Plans for a new industry, combining mining, processing and manufacturing, were announced recently by Bruce E. Collins, Sr., president of Tech Research, Inc., of Phoenix.

The new industry will constitute the Mineral Plastics Division of the firm, with temporary headquarters at 3954 E. Guaymas St.

Collins said the mill, processing plant and the mining operation will employ some 100 persons at the start.

Umatilla Canning Plans Expansion

MILTON-FREEWATER, ORE. — Umatilla Canning Co. will start an expansion program soon, according to W. S. Miller, general manager.

First phase of the program is expected to cost approximately \$250,000. Work will include relocation of freezing facilities, and an increase in facilities for producing frozen asparagus and frozen corn.

The new freezing unit will be capable of handling 120 tons of products every 24 hours, according to Miller. The repacking line also will be mechanized, and a tote bin handling system installed.

Expansion Program For Sterling Steel

DENVER—Sterling Steel & Supply Co. has spent \$800,000 on an expansion program and has moved its new 58,000-square-foot shop and 7,000-square-foot office at West 49th Ave. and the Valley Highway, here.

Jack A. Speyer is general manager of the firm which specializes in fabrication and erection of steel bridges and buildings, also in distribution of steel products.

Yarborough Sales Named Western Representative

SAN MARINO, CALIF. — Johnson & Hoffman Mfg. Corp., Mineola, N. Y., manufacturers of precision metal stampings and deep-drawn parts, has appointed Yarborough Sales Co., 2636 Mission St., here, as its sales representative for California, Washington and Oregon.

The stampings and deep-drawn parts made by Johnson & Hoffman are used in semi-conductors, vacuum tubes and other electronic assemblies and in general industrial products.

Houston Fearless Expands Activities

LOS ANGELES — Houston Fearless Corp. has taken possession of a modern 6,000 ft. plant in West Los Angeles as a step in the expansion of its communications activities. Thomas C. Clark, general manager of the div., said that the facility will be used for both research and manufacturing in the fields of advanced military and industrial communications equipment.

The move brings to three the number of plant sites currently making up the Houston Fearless div. In addition to the div.'s main 80,000-ft. plant in West Los Angeles, which also houses corporate headquarters, the Saticoy, Calif. facility has recently been reactivated. Located on a 70-acre site near Ventura, the Saticoy plant is manufacturing astrodomes, microwave antennas, tracking mounts, and antenna rotators.

Tally Register Corp. Moves Into New Plant

SEATTLE—Tally Register Corporation, fast growing Seattle maker of punched paper tape data processing, storage, acquisition equipment, occupied a new plant on January 1, 1960, according to an announcement by Philip E. Renshaw, president of the firm.

The new offices and manufacturing area, located at 1310 Mercer in Seattle's Westlake district, contains 17,500 sq. ft., Mr. Renshaw said. Ultimately, the site allows for an expansion to 35,000 sq. ft.

Complete facilities are included for the manufacture of equipment meeting both military, scientific and industrial needs. Located on one floor, the glass aluminum structure features high density lighting, environmental test facilities and 600 ampere power service.

Aerojet Develops New Type Oxygen Unit

AZUSA, CALIF. — Aerojet-General Corp.'s Chemical Div. here has announced development of a new transportable oxygen unit which produces an unlimited supply of oxygen from the atmosphere and eliminates the usual heavy steel supply cylinders.

The present model is about 2 ft. sq. and weighs 150 lbs. However, the flexible internal design permits fabrication in almost any shape and size.

The invention is expected to have wide application, including industrial welding and cutting of metals.

Weyerhaeuser Net Income Up 22 Per Cent for 1959

TACOMA, WASH. — The Weyerhaeuser Co.'s net income for 1959 amounted to \$60,407,000, a 22% increase over the previous year, but 7% below record earnings of 1956, according to the annual report released recently.

Output of the firm's 14 lumber mills reached a new high, 1.3 billion board-foot, 8% above 1958. A record high quantity of plywood was also turned out, due largely to expanded production facilities.

On its tree farms in Oregon and Washington, Weyerhaeuser reforested a total of 28,000 acres. The reseeding and planting activities covered "considerably in excess of the number of acres logged," according to the report.

Ling-Altec in Production At Enlarged Anaheim Plant

ANAHEIM, CALIF. — Ling-Altec Electronics, Inc. have officially opened the doors to their new \$600,000 expansion to their plant here.

The enlarged facility, which includes one new manufacturing building, provides approximately 65,000 additional sq. ft. of plant area on the company's 13-acre site located near Harbor Blvd. and the Santa Ana Freeway at 1515 So. Manchester. The company's total investment in the property exceeds \$2,000,000.

All equipment and personnel have moved to the new plant from the former Ling plant in Culver City, Calif. High power vibration test equipment and sonar components are manufactured in the facility which employs more than 450 persons.

Electronic Engineering Acquires Anaheim Firm

SANTA ANA, CALIF. — Burgess Dempster, president of Electronic Engineering Co. of Calif., has announced his company's purchase of the Anaheim Electronics Co., Inc., 1016 Raymond Way, Anaheim.

Principal product of the acquired firm is an electronic program control device which performs a programming function for test purposes such as in the tactical and production line check-out of guided missiles.

Anaheim Electronics, founded in 1956, will operate as a division of the parent firm with its president, Robert T. Arnold serving as div. manager.

Garrett Forms Tokyo Subsidiary

LOS ANGELES — The formation of a subsidiary company, Garrett (Japan) Limited in Tokyo, has been announced by E. A. Bellande, vice president of foreign operations for the Garrett Corp., here.

Garrett manufactures component parts and systems for aircraft and missiles, and now operates through four subsidiaries and seven divisions including AiResearch Mfg. Divisions here and in Phoenix.

Western Conveyor Names Engineering Div. Head

BOISE, IDAHO — Western Conveyor Co., here, has announced appointment of C. W. Mohme to head its new Contract Engineering Division.

Robert N. Burns, executive vice president of Western Conveyor, said Mohme and his staff would provide a diversified consulting service for Western industries in the initial planning or modification of operational plant systems, equipment, structures and foundations.

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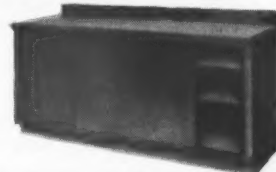
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Northern California Machinery Show Announces Exhibitors

OAKLAND, CALIF.—The first Northern California Machinery Show has received confirmation from 56 manufacturers who will exhibit and demonstrate their machinery in action. The show will be held March 17-19 at the Exposition Building, 10th and Fallon Sts., here.

Haven Machinery and Supply Co., machinery distributor sponsoring the show, invites members of the wood-working and metalworking industries to bring their cutting and production problems to the factory experts for suggested solutions.

Among the exhibitors, the Wells Mfg. Co. will demonstrate their largest metal cutting band saw with automatic feed. It can cut a twenty foot metal bar into pre-set lengths automatically, with no supervision required.

The Max Mfg. Co. will exhibit \$16,000 worth of equipment. Sanders, planers, and a complete line of hand saw and circular saw sharpening equipment.

The De Walt Div. of American Machine and Foundry Co. will display a new two post cut-off machine with a long arm that is capable of cutting off 4 to 10-ft. panels. It can handle composition and metal panels as well as wood. This is the first exhibition of this machine in the West.

Nutting Company Names Spokane Representative

SPOKANE, WASH. — The Carter-Miller Furnishing Co., North 1324 Ash St., here, has been appointed sales representative for the Spokane territory of the Nutting Truck and Caster Co. of Faribault, Minn.

Carter-Miller will handle the complete industrial and institutional lines of Nutting floor trucks, casters and wheels, in addition to its other lines of materials handling equipment.

Universal Electronics Expands

SANTA MONICA, CALIF. — Edward Lacey, president of Universal Electronics Co., manufacturers of transistorized power supplies, has announced the completion of a new building adjacent to present quarters at 1720 22nd St., here. The 11,000 sq. ft. addition will facilitate the company's expansion of its military division.

The Rotex Punch Co. will exhibit their new power horizontal mill, a production machine with the table actuated by air cylinders.

The largest single machine on exhibit will be the Beach 49-in. two drum sander. The drums revolve and oscillate, and the machine is capable of sanding panels up to 4 ft. wide by any length.

Beach will also display for the first time a new single-drum power-fed sander.

As many machines as possible will be operated in the building to present them "on the job." Factory representatives will be present to answer any questions concerning the operating, savings, capabilities, maintenance and cost of their products.

The show will be open from 1 p.m. to 10 p.m. March 17 and 18 to members of the industry with free buffet supper served at 5:30; on Saturday, March 19 the public will be admitted from 10 to 10. Prize drawings will be held at intervals all three days.

Free tickets to the exposition are available upon request from any branch of Haven Machinery and Supply Co., Oakland, San Francisco, Sacramento, San Jose, or Fresno.

In order to reduce the chance of injury, admission is limited to persons 18 years of age or over.

New Plant for Nu-Art Lighting

SALT LAKE CITY—Nu-Art Lighting & Mfg. Co., founded in 1941 by Herbert R. Schopf and Association, will expand into a new \$150,000 home at 2450 West 21st South in Industrial Center, according to Schoepf.

Both production and employment will be doubled in the 30,000 sq. ft. structure, he announced. Employment at the present factory at 235 East 5th South is 30.

Krogh Pump Acquisition

SAN FRANCISCO — Krogh Pump Co., here, manufacturers of abrasive and corrosive pumps, have announced the acquisition of Contract Machine Shop, also of San Francisco. Renamed Contract Machine Works, the acquired firm specializes in designing and manufacturing small machinery to order as well as general machining.

McGraw-Edison Acquires Two Phoenix Firms

PHOENIX — International Metal Products Co. and Continental Mfg. Co., manufacturers of evaporative coolers and central air conditioning units, have been sold to McGraw-Edison Co., Chicago, according to Adam D. Goettl, president of the local firms. The new company will be known as International Metal Products Div. of McGraw-Edison.

Included in the sale is International's Monterrey, Mexico, plant which employs 350. The local plants cover 314,000 sq. ft. of plant space and have a payroll of 1,100 employees. Goettl will continue as president of the division.

Pacific Coast Instrument Rep for Durant Mfg. Co.

SAN FRANCISCO—Durant Mfg. Co. of Milwaukee, Wisc., has announced the establishment of an authorized Durant industrial counter repair center with the Pacific Coast Instrument Co., 256 Mission St., here.

The appointment is designed to supplement the sales, distribution and engineering services now available to Durant customers on the West Coast.

Eureka Metals Supply Names Vice President

LOS ANGELES—B. N. Miller, president of Eureka Metals Supply Co., 551 Macy St., here, has appointed Charles E. Coulson as vice-president in charge of sales. Formerly sales manager, Coulson has been associated with Eureka for over 12 years.

Eureka is a distributor of Kaiser Aluminum, Bridgeport Brass and Copper, and Stainless Steel sheet. Covering the Southwest, they supply the aircraft industry, electronics and missile field, ranchers and farmers, trailer manufacturers and machine shops as well as metal fabricators.

Litton Acquisition

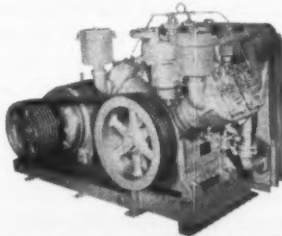
BEVERLY HILLS, CALIF.—The Electronic Systems Div. of General Controls Co. has been acquired by Litton Industries, according to an announcement made jointly by Dr. H. E. Singleton, Litton vice president and Electron Equipment Div. general manager, and William A. Ray, president of the General Controls Co.

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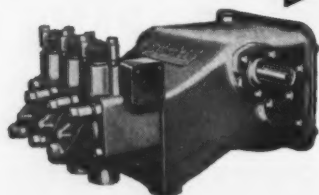
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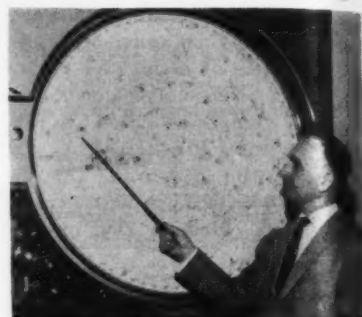
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78

Unique Portable "Educational Planetarium" Streamlines Understanding of Space Age

LOS ANGELES — A compact, precise demonstrational instrument designed to stimulate interest in the astronomical sciences, speed the training of such subjects as celestial navigation, planetary movements and astronautics, and serve as an "astronomical slide rule" to the professional astronomer and space physicist, has been introduced by Scientific Industries, Inc., 8401 E. Slauson Ave., Pico Rivera.

Called the "Musser Copernican Planetarium," it is said to be the first instrument of its kind ever developed. The instrument features a four-foot circular viewing screen upon which is rear-projected an accurate representation of the solar system or a star map of the visible skies. Either type of presentation may be put into motion, to illustrate the actual movements of the planets and asteroids around the sun, or the apparent motion of the stars as seen from the Earth. The speed of movement is variable, and, in the case of the solar system presentation, the planets may be operated individually or together. Time may be compressed, expended, projected into the future, or reversed into the past; thus, the sky "comes under control."



Designer Clair Musser demonstrates navigational astronomy with overlay on "Copernican" planetarium. Ready for demonstration at Dr. Musser's hand is power driven star map overlay for teaching celestial navigation. When star overlay is removed controlled planets and asteroids appear and revolve in their natural orbital speed ratios.

As an educational and training aid, several special overlays are provided with the instrument, including orbits of prominent and interesting comets, configurations of inferior or superior planets, and conversion of heliocentric and geocentric coordinates.

The instrument combines mathematical and physical precision with compact size. It can be adapted to audiences of any age level or degree of scientific knowledge.

Mead Corp. Opens LA Packaging Division

LOS ANGELES — The Mead Corp., large paper and paperboard manufacturer with headquarters in Dayton, Ohio, has opened its first manufacturing operation on the West Coast. The new division is located here at 2726 Fruitland Ave. and is under the direction of Homer G. Murphy, general manager.

Mead Packaging here will be devoted to the production of custom designed folding cartons, bottle masters and multiple packaging.

The firm has sales offices here as well as San Francisco, Portland, Salt Lake City and Phoenix.

Robbins Aviation Appoints New Dealer

ENGLEWOOD, COLO. — Rocket Components Co. here has been appointed as a dealer by Robbins Aviation, Inc. Robbins makes dehydration and purification equipment and metering valves used in the aircraft, missiles, petroleum, chemical and gas industries.

Synthane Establishes West Coast Facilities

GLENDALE, CALIF. — To improve service to West Coast customers Synthane Corp. of Oaks, Pa., manufacturers of industrial laminated plastics, has announced new fabricating and warehouse facilities.

The new operations are headquartered at 518 Garfield Ave., here, with Bert C. Kibre as manager. Previously, all basic fabricating was done at the Oaks, Pa., plant, however, the basic fabricating facilities in the warehouse here will permit the firm to offer sheets in strips and panels, sawed and sheared, bandsawed blanks, and tubes and rods cut to length.

Fed. Uranium, Radorock Merge

SALT LAKE CITY — Directors of Federal Uranium Corp. and Radorock Resources, Inc., have approved a merger of the two firms, subject to stockholder approval. The joint venture will include a uranium mining and milling facility in the Gas Hills area of Wyoming.

P.I.E. Building New Freight Terminal

SALT LAKE CITY — A. S. Glikbarg, president of Pacific Inter-mountain Express, has announced construction of a general freight terminal on a 12-acre site at 65 South Redwood Road at Salt Lake City. The combination district office, terminal and shop, housing 275 employees, is to be ready for occupancy not later than June 15, 1960.

Terminal layout principles developed by the trucking industry are incorporated into the basic design to provide a completely modern facility affording maximum efficiency in freight operations. Use of carts on the dock plus systematized yard traffic patterns will improve freight handling and customer service for the entire Intermountain area served by this key terminal.

The new facility will include a 45x79-ft. two-story air-conditioned office of split-level design; an 80x289ft. dock with 51 doors; and an 80x101-ft. shop fully equipped with maintenance machines and tools.

Distress Transmitters For Small Aircraft

DENVER — The K-Alpha Co., 2626 Adams St., has begun operations to manufacture and market the K-Alpha distress marker generator for small aircraft owners, according to Orville Scott Slaughter, Jr., president of the new firm.

A 20-transistor device that will transmit automatic pre-programmed distress signals upon any impact other than a normal landing, the K-Alpha is a "line of sight" transmitter. It has a range of 5-10 miles in mountainous terrain and of 125 miles in flat country.

Research is now being carried on to adopt the device for military and commercial use, Slaughter said.

Goodrich To Build Tire Retread Plant

SACRAMENTO, CALIF. — O. K. Lynn, San Francisco zone manager of B. F. Goodrich Co., has announced plans for construction of a automobile tire retreading plant here costing approximately \$100,000. Production capacity is to be 1,160 retread units a month, according to Lynn.

Aeronutronic Strengthens Research Activities

NEWPORT BEACH, CALIF. — A major shift in basic and applied research activities at Aeronutronic, a division of Ford Motor Co., has been announced by Gerald J. Lynch, a Ford vice president and division general manager.

Eight key management changes have resulted, including the elevation of nationally known scientist Dr. Montgomery H. Johnson to a top level scientific advisory position. All basic research functions within the division have been consolidated into Aeronutronic's research operations headed by Dr. Lloyd P. Smith, general operations manager.

Telecomputing Offers To Acquire Narmco

LOS ANGELES — Telecomputing Corp., of Los Angeles, has offered to acquire all of the outstanding stock of Narmco Industries, Inc., of San Diego, manufacturer of resins, coatings, adhesives, metal bondings and plastic sporting goods, according to Wm. R. Whitaker, president of Telecomputing.

The transaction, which is based upon exchanging one share of Narmco stock for two shares of Telecomputing, will involve a maximum of approximately 497,000 Telecomputing common shares. The acquisition, which has been approved by the Board of Directors of Telecomputing, is subject to approval by Narmco shareholders. It is expected that the transaction will be consummated in the near future.

High Grade Coke Plant 250 Ton Daily Capacity

KEMMERER, WYO. — A coke plant capable of producing high grade coke from nearby sub-bituminous coal deposits, costing some \$4 million, has been announced by Food Machinery & Chemical Corp. of New York.

Construction is expected to start presently with the plant ready for "shakedown" in August or early September, according to Henry Messman, manager of Carbon Products, a subsidiary of FMCC.

The development plant here will have a capacity of 250 tons of coke daily, and will use 500 tons of coal in the production process.



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... for more details, circle No. 43

Niagara Chemical Organizes New Western Department

FRESNO, CALIF. — A major reorganization of its Western operations has been announced by Niagara Chemical Div. of Food Machinery and Chemical Corp.

Formerly Niagara has produced its full line of products for West Coast consumption in Richmond, Calif. and Yakima, Wash. However, the plant here, formerly operated by Sunland Industries, Inc., will bring expanded production of some pesticides plus initial entry into seed and fertilizer production for the company as a whole.

Niagara's Western agricultural department will be managed by L. M. Duckworth, Western regional managers being James H. Molich, Fresno; Rolf Haasarud, Richmond, Calif.; James Southwick, Anaheim, Calif.; and William Castro, Yakima, Wash.

Special Designed Plant For Delta Lithograph

VAN NUYS, CALIF. — The new Delta Lithograph Co. plant is nearing completion and is expected to be ready for occupancy in April.

Situated at 14731 Califa St., here, the 20,800 sq. ft. structure is designed specifically to house a lithography operation. According to co-owners Walter Wilkinson and Dale McCollough, the single-purpose plant will incorporate several features aimed at creating extra efficiency.

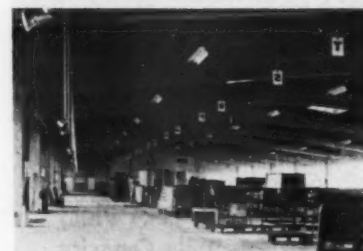
Windowless for security, the firm is one of a handful in Los Angeles-Orange counties cleared by the U.S. Government to print classified material, Delta's plant also will contain two special security vaults for storing such material when not in actual use.

Western Steel Firm To Process Iron Powder

CHEYENNE, WYO. — A 250-ton capacity plant for producing iron powder directly from iron ore is to be built in the Cheyenne-Laramie area, according to Louis Kalman, president of Western Steel Co., Inc., utilizing iron ore obtained from deposits on Iron Mountain, some 35 miles northwest of Cheyenne.

The plant will be built following completion of a \$145,000 prototype plant. Western Steel has been granted a universal contract for a new process of producing the powder.

GARRETT OPENS NEW TERMINAL



EMERYVILLE, CALIF. — In a combination step to create new and better services for Western shippers and increase working efficiency, this past month the Garrett Freightlines, of Pocatello, Idaho, opened a new freight terminal here.

Emeryville, the heart of the industrial area of the east side of San Francisco Bay, is sandwiched between Berkeley on the north and Oakland on the south. The new freight terminal is strategically located so that the 8-lane Eastshore Freeway, which cuts through the center of Emeryville, becomes the Garrett driveway. This provides a natural escape route from metropolitan traffic jams which often result in both delay in freight deliveries and increased freight handling costs. Both inbound and outbound vehicles have immediate access to this major freeway.

The new freight terminal, located on an 11-acre site, is so situated that it can easily be expanded to meet added demands for service. The paved area for parking and moving equipment is designed for minimum effort in readying vehicles for either unloading or dispatch to other cities.

From a freight-handling standpoint, the 289-ft. dock combines a new idea of the company—minute-man carts, which are closed on three sides and can be loaded into or out of pickup vans without actual handling of the individual boxes or packages. Pickup drivers can load their freight into empty carts as they cover their daily routes; when they arrive back at the terminal the carts can be wheeled to the dock and connected to the Towveyor system, and readied for departure from the Bay Area.

The terminal is under the direction of W. A. Mottishaw with W. A. Brooks, who was recently appointed district sales manager for the area, to lead the 10-man selling team.

President Clarence A. Garrett, co-founder of the 47-year old motor carrier, stated, "This new terminal more clearly points out that service is our only product." In explaining further, he said, "With freight rates comparable, it then becomes our problem to move the freight faster, better and more safely, than our competitors. This is one of the ways of achieving that goal."

Top: President Clarence A. Garrett and several officers of the Garrett Freightlines, Inc. recently visited Emeryville, Calif. for the opening of their new branch quarters here. Left to right are L. M. Allsberry, vice pres. operations; Pres. Garrett and W. J. Wilson, executive vice pres.

Second: Exterior of office building located just off the freeway at 6400 Eastshore Freeway.

Third: Ultra modern freight terminal where everything is geared to expedite shipping. After trucks are loaded they drive onto a scale which automatically weighs load.

Bottom: Interior view of terminal installation. Total cost of the new development was \$900,000.

Dumont Mfg. Occupies Expanded Facilities

SAN RAFAEL, CALIF. — The Dumont Mfg. Co., subsidiary of Dutron Corp., moved into new facilities recently adjacent to its manufacturing complex here at 607 Irwin St.

Dumont also installed a new 2000 ton press for compression molding of missile components.

A fabricator of high temperature plastic materials for use in missiles, aircraft and spacecraft, the addition of the new plant area boosted Dumont's manufacturing floor space to 61,000 sq. ft.

Oliver Corp. Opens New NW Headquarters

PORTLAND — A new \$500,000 Northwestern district warehousing and serving headquarters for the Oliver Corp. was opened recently at 18203 N.E. Halsey St., here.

Situated on a 5-acre tract, the building is 60,000 sq. ft. in area. It includes a warehouse covering 32,500 sq. ft. The company has introduced several new tractor lines during the past year.

Kaiser Reports 1959 Earnings

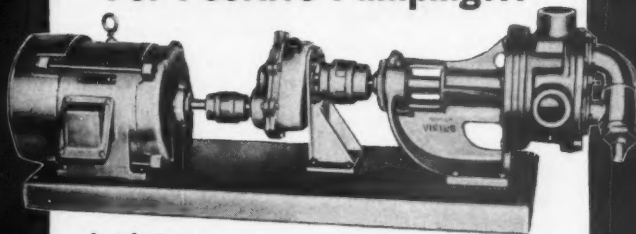
OAKLAND, CALIF. — Kaiser Industries Corp. have reported consolidated net earnings of \$15,740,000 for the year ended December 31, 1959, as compared with \$14,951,000 in 1958. Earnings per share of common stock after provision for preferred dividends, were \$.61 in 1959 and \$.58 in 1958. In commenting on 1959 earnings, Edgar F. Kaiser, president, pointed out that 1959 pre-tax earnings were \$17,120,000 as compared with \$14,367,000 in 1958.

Kierulff Electronics Names Importer Affiliate

LOS ANGELES — Capkit, International, Inc., has been formed as an affiliate of Kierulff enterprises, according to an announcement by C. T. Kierulff, president of the Kierulff Electronics, Inc.

The new company was formed to provide U. S. representation to Japanese manufacturers of electronic units and electrical parts and equipment, and to act as purchasing organization for American industry, according to Kierulff.

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Stauffer Expands Nevada Operation

HENDERSON, NEVADA—Stauffer Chemical Co. is expanding its chlorine-caustic plant here. Scheduled for completion by May, the expansion will increase output of the local unit by about 25%.

The expansion is being made to serve the increasing Western demand for chlorine, including that from American Chemical Corp., which uses chlorine as a raw material for the manufacture of chlorinated hydrocarbons.

Lockheed Aircraft Acquires Interest in Redlands Firm

BURBANK, CALIF. — The Lockheed Aircraft Corp. has reached an agreement to acquire 50% in the Grand Central Rocket Co. of Redlands, Calif.

Grand Central Rocket is the nation's fourth-largest firm in the solid propellant field. According to Lockheed Chairman Robert E. Gross, the acquisition is aimed at rounding out Lockheed's missile, satellite and spacecraft capabilities.

Automation Breaks Ground For New Plant Facility

MANHATTAN BEACH, CALIF. — Ground breaking for a new 30,000 sq. ft. engineering and production plant facility adjacent to the Torrance Airport, Torrance, Calif., has taken place, according to Corwin D. Denney, president of Automation Industries, Inc.

"The facility is expected to be completed by June 1960 and will house the Company's Ultrasonics Divisions and the Corporate Office," Denney said. The new plant will replace the Company's present facilities in Van Nuys, Pasadena, and Paramount, California.

Voit Rubber Plans Bowling Ball Plant

SANTA ANA, CALIF.—Page Parker, vice president of W. J. Voit Rubber Co., has announced ground breaking for a 40,000 sq. ft. structure, here, to cost approximately \$1,250,000.

Scheduled for completion in May, Parker said the concrete tilt-up style structure will be linked to the firm's present 60,000 sq. ft. \$2,000,000 tread rubber building at 18492 Harbor Blvd.

Voit is a subsidiary of American Machine and Foundry Co. Parker said between 70 and 100 persons will be employed in the manufacture of bowling balls.

Pacific Wire Rope Forms Specialty Products Div.

LOS ANGELES—The Pacific Wire Rope Co. has announced the formation of a Specialty Products Div. with four departments. The newly-formed division was created to meet the need for material handling equipment by industries on the West Coast, according to president and general manager, Kellogg Spear.

The new division under H. M. Worcester, Jr., will be manned by technicians and engineers in the field of wire rope assemblies, and comprises four separate departments; the rigging, fitting, swaging and plastics departments. The company is located at 1840 E. 15th St., here.

U. S. Rubber Names Portland Rep

PORTLAND — The Breeze Supply Co., 3321 N. W. Yeon Ave., here, has been appointed a general distributor for a wide line of industrial rubber products manufactured by U. S. Rubber Co.

Swiss Subsidiary Formed by Eimac

SAN CARLOS, CALIF.—A new subsidiary has been formed in Geneva, Switzerland, by Eitel-McCullough Inc., manufacturer of Eimac electron-power tubes.

The corporation known as Eitel-McCullough, S.A., will serve as a marketing function for Eimac in Europe and will not initially include a manufacturing operation. It will be responsible for sales, services, patents and licensing in connection with the promotion and sale of Eimac products.

Warren Hoffman, Export Manager of Eimac, leaves his post during March to become managing administrator and chairman of the board of the new company.

Magnetic Amplifiers To Merge With Siegler Corp.

LOS ANGELES—An agreement to merge Magnetic Amplifiers, Inc., New York City, a leading producer of equipment utilizing solid state devices, into the Siegler Corp., here, was announced recently by John G. Brooks, president of the Siegler Corp., and Harold A. Goldsmith, president, and Herbert Herz, executive vice president of Magnetic Amplifiers, Inc.

Sales volume for Magnetic in the recently concluded 1959 fiscal year was more than \$3,000,000. Company headquarters and principal plant facility are located in New York City, however the company also operates a plant in El Segundo, Calif.

Borden Chemical Breaks Ground for Fremont Plant

FREMONT, CALIF. — Ground was broken recently for construction of a 90 million pound per year resins and formaldehyde plant on a 26.8-acre site here.

The resins plant is tentatively scheduled for completion in April, 1960 and the formaldehyde plant in the fall of the year. The land was purchased from the Southern Pacific Co.

Coach Co. To Expand

LONGMONT, COLO. — Red-Dale Coach Co. here has purchased a tract in the city's Industrial Park area for a larger plant, according to Dale Martfeld, one of the owners.

As soon as it is completed, the plant will move from its West Hover Lane location and at least 20 men will be employed.

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LA Chamber Making Market Analysis Survey

LOS ANGELES—Southern California industrial firms are the targets of a comprehensive market analysis survey now being conducted by the Los Angeles Chamber of Commerce, according to President *James S. Cantlen*.

Purpose of the poll, said Cantlen, is to assist local firms in their search for new items that could be profitably manufactured here by focusing attention on various types of goods not now produced locally.

Arcos Corp. Opens New Los Angeles Warehouse

LOS ANGELES—Arcos Corp., Philadelphia manufacturer of welding rods and electrodes, has moved from 123 So. Santa Fe Ave., here, to a new warehouse-sales office building at 6222 Chalet Drive, Bell Gardens, here.

The office will be headed by *Charles L. Godward*, district manager. The move places Arcos in its own building with processing facilities for aluminum welding wire and provides greater warehousing space.

Kaiser Aluminum Appoints Southwestern Distributor

OAKLAND, CALIF. — Custom Rolled Corrugated Metals Company (CURCO) has been appointed a distributor of Kaiser Aluminum industrial building products in Southern California, Arizona, and Southern Nevada.

The firm has established offices at 2119 So. Atlantic Blvd. in Los Angeles and will carry a complete line of Kaiser Aluminum industrial siding and roofing in lengths up to 30 feet with accessories at warehouse facilities in the Los Angeles area.

Cascade, Pacific Gas Merger Underway

SEATTLE—Directors of Cascade Natural Gas Corp. and Pacific Natural Gas Corp. have agreed upon a merger.

Operating supervision of the combined companies gradually will be taken over by the Cascade management.

Pacific National now serves natural gas to Longview, Kelso, Woodland, Castle Rock, Mount Vernon, Monroe and Snohomish. This will be the third such move by Cascade in the past five months.

Starrett Co. Opens Los Angeles Branch

LOS ANGELES — A Western branch office of the L. S. Starrett Co., with headquarters at Athol, Mass., has been opened at 5946 E. Washington Blvd., here.

The new integrated office and warehouse building will stock the firm's hand and power hacksaws, metal cutting band saws, high speed sheet metal cutting band saws, hole saws, low carbon precision ground flat stock, oil and air hardening precision ground flat stock.

Inter-Mountain Instruments Moves to Larger Quarters

ALBUQUERQUE — Inter-Mountain Instruments branch of the Electronics Div., Curtiss-Wright Corp., has moved to new and larger plant facilities at 5400 Acoma Road, S.E., here, it was announced by *Julius R. Pascuzzo*, vice president and general manager.

Pascuzzo described the move as part of a planned expansion of the division's new product development program, doubling the presently available floor space.

Green-Penny Named Moto-Truc Co. Rep.

LOS ANGELES—The Moto-Truc Co., of Cleveland, Ohio, producers of walkie and small rider type industrial trucks, recently appointed the Green-Penny Corp. as exclusive sales agents in the Southern California area.

The Green-Penny material handling organization will maintain complete stocks of repair parts and provide service for Moto-Truc vehicles. Offices, shop and warehousing facilities for Green-Penny are at 4180 E. North Oaks St., here.

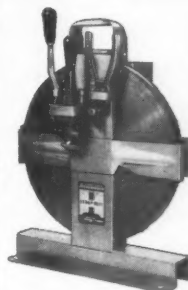
Japan Buys Uranium Oxide From Western Nuclear

DENVER—Western Nuclear, Inc., Rawlins, Wyo., has signed an agreement, subject to approval of the AEC, to supply a Japanese government agency with two metric tons of uranium oxide, said *Robert W. Adams*, president.

He said the shipment of uranium oxide, or yellowcake, to the Japan Atomic Fuels Corp. would be made from the firm's mill at Jeffrey City, Wyo., to be used in experimental reactors for production of electrical power.

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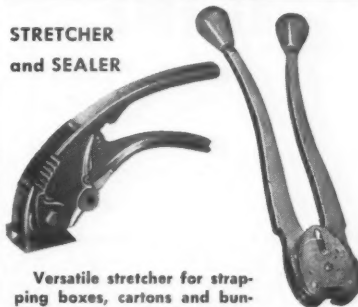
NEW PRODUCTS



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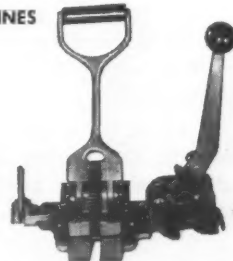
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westerners at work



George Wulff
Rockwell Mfg.



J. A. Lauger
Foucar, Ray & Simon



E. C. Buckingham
Superweld Corp.



R. D. O'Brien
Pacific Car & Foundry



W. C. Hagens
White Motor



R. A. Baskam
GE Computer



Pete Conner
Hyster Co.



Max D. Liston
Beckman

■ **George Wulff** has been named sales manager for Rockwell Mfg. Co.'s Walker-Turner Div., covering California, Nevada and Arizona.

■ **John A. Lauger** is the newly appointed sales manager of tubular products, Foucar, Ray & Simon at San Francisco.

■ **E. C. Buckingham** has joined the sales staff of Superweld Corp., North Hollywood, Calif.

■ **Robert D. O'Brien** has been appointed executive vice president of Pacific Car & Foundry Co., Seattle.

■ **William C. Hagens** has rejoined the White Motor Co. as manager of the San Francisco branch territory.

■ **Robert A. Baskam** has been named manager of application engineering, GE, Computer Dept. at Phoenix.

■ **Pete Conner** has been transferred to San Francisco as officer manager of Hyster Co., Industrial Truck Div.

■ **Max D. Liston** has been named director of the newly formed Special Products Div. of Beckman Instruments, Inc., Fullerton, Calif.

■ **Richard C. Watkins, Jr.** has retired as manager Utah Oil Refining Co. at Salt Lake City.

■ **S. A. Keller** has been named general manager Minneapolis-Honeywell Regulator Co., Heiland Div., Denver.

■ **Robert J. McNally** has been elected vice president of Garfield Chemical & Mfg. Corp. at Salt Lake City.

■ **John H. Harrington** has joined Jacobs Engineering Co., Pasadena, Calif. as construction manager.

■ **Roy A. Waltman** has joined Red Point Corp., Burbank, Calif., as sales manager.

■ **Jack R. Anderson** has been named regional engineer for Bay State Abrasive Products Co., Long Beach.

■ **R. W. Akerlow** of Stearns-Roger Mfg. Co., Denver, has been elected president of Colorado Mfg. Assoc.

■ **George A. Jedenoff** has been promoted to general supt. of Columbia-Geneva Div., U.S. Steel, at Geneva Works, Utah.

■ **Milo I. Wilcox** is newly appointed Northern Div. office manager for Richfield Oil Corp., Seattle.

■ **Donald T. Fowler** has been named advertising manager of the four-div. components group, Litton Industries, Beverly Hills, Calif.

■ **D. S. Tarbox**, manager of Sandia Corp.'s engineering dept., has been promoted to director of security and industrial relations.

■ **H. J. Zabel** has retired as president of Phoenix Concrete Co. **Donald E. Muir** is the new president.

■ **Dr. Nicholas A. Begovich** has been appointed assistant manager of Hughes Aircraft's Ground Systems Group, Fullerton, Calif.

■ **Curt R. Copenhagen** has been appointed public relations rep. for the Long-Bell Div. of International Paper Co., Longview, Wash.

■ **Bruce M. Ryan** has been named director of public affairs of Bonanza Air Lines, Las Vegas.

■ **Frank McGrane** has been appointed manager of the San Francisco office of American Potash & Chemical Corp.

■ **Charles Mitchell** has been appointed sales manager Latin America, Tractor-Loader Div., Eimco Corp., Salt Lake City.



C. C. Harshberger
Western Gear



R. L. Donaldson
Am. Drill Bushing



J. F. Walker
Besler Corp.



Dr. V. B. Corey
United Control



J. G. White
Bethlehem



A. Galbraith
Stanley Tools



R. L. Daniels
Garrett Corp.



W. B. Huegin
Huck Mfg.

■ **Charles C. Harshberger** is the newly named Seattle district sales manager for Western Gear Corp.

■ **Raymond L. Donaldson** has been appointed Western manager for American Drill Bushing Co., Los Angeles.

■ **John F. Walker** has joined Besler Corp., Oakland, Calif. as a sales engineer.

■ **Dr. Victor B. Corey** is the new vice president of United Control Corp., San Francisco.

■ **John G. White** has been named general manager, sales, Pacific Coast Div. of Bethlehem Steel Co., San Francisco.

■ **Alexander Galbraith** is newly appointed regional manager for Stanley Tools, Div. of Stanley Works, at San Francisco.

■ **Robert L. Daniels** has been appointed director of industrial supply for the Garrett Corp., Los Angeles.

■ **William B. Huegin** is now the Western Commercial div. manager for Huck Mfg. Co., Los Angeles.

■ **Pat Bryan** is new manager of The Sloan Co.'s newly activated Auto-Timer Div. at Sun Valley, Calif.

■ **Harry J. Glutting, Jr.** has been named plastic materials sales rep for B. F. Goodrich Chemical for area from San Francisco north.

■ **Johan H. G. Maters** has been appointed executive vice president, manufacturing, Perkin Engineering Corp., El Segundo, Calif.

■ **Dr. Donald A. Dunn** is director of the newly formed Research Div. of Eitel-McCullough, Inc., San Carlos, Calif.

■ **George E. Nelson** has been named production manager of Bemis Bros. Bag Co., San Francisco plant.

■ **Warner B. McCarthy** has been appointed vice president and comptroller of Parker Aircraft Co., Los Angeles.

■ **Ernest A. Wester** is newly elected vice president and treasurer of Servomechanisms, Inc., Hawthorne, Calif.

■ **Charles G. Ranney** is heading the new industrial sales division of Sunset Line & Twine Co. with headquarters in Petaluma, Calif.

■ **LeRoy Oliver** has been named chief technical rep. of Voi-Shan Mfg. Co., Culver City, Calif.

■ **Gordon Rusk** has been named sales engineer of Vinson Engineering & Sales Co., Van Nuys, Calif.

■ **John K. Hilliard** heads the new div. of Ling-Altec Research as vice-president and director, Anaheim, Calif.

■ **Ralph C. Greiner** has been newly appointed as Western sales manager of Uhrden, Inc., at San Francisco.

■ **Glen P. Bieging** has joined Packard Bell Electronics Corp. as vice president, marketing, Los Angeles.

■ **Howard E. Good** has been appointed as industrial sales engineer, Weightman & Assoc., Burbank, Calif.

■ **L. L. Compiano** has been named purchasing agent at Pacific Coast Engineering Co., Alameda, Calif.

■ **Dr. Oskar E. Mattiat** has been appointed chief scientist of Acoustica Assoc. Inc., Los Angeles.

■ **Thomas C. Osborn** is new traffic manager for Santa Fe Railroad at Phoenix.

■ **S. G. Dukelow** succeeds **V. A. Rumble**, retiring manager of the Bailey Meter Co., San Francisco dist.

■ **Howard B. Richman** is the new manager of Dow Chemical's phenol plant at Kalama, Wash.

■ **Woodrow Wilson** has been named controller of Sweden Freezer Mfg. Co. at Seattle.

■ **San Oxarart** has been appointed sales and customer relations representative of U. S. Science Corp., Los Angeles, a subsidiary of United Industrial Corp.

■ **Jack B. Lindsey** has been named assistant to the president for administration by Microdot Inc., South Pasadena, Calif. electronics manufacturers.

■ **Donald F. Adams**, Washington State University, has accepted an appointment as chairman of the air pollution instrumentation committee of the Instrument Society of America.

■ **Harvey A. Skillman** is new West Coast manager of the press and die supply divisions, and **Milton J. Jefferis** is new factory manager for E. W. Bliss Co.'s new quarters in City of Industry, Calif.

■ **Theodore M. Freedman** has been appointed corporate controller for Royal Industries, Inc., Los Angeles.

■ **Howard L. Bredlow** has been named West Coast sales representative for Vulcan Rubber Products Div. of Reeves Brothers, Inc.

■ **Conrad Kunze** has been appointed assistant manager, operations, for the Convair San Diego Div. of General Dynamics Corp.

■ **Thomas W. Waldrop** has joined Daystrom, Inc., control systems division, as systems coordinator at their LaJolla, Calif. plant.

■ **M. H. Fesler** has been named Kobe, Inc.'s Western industrial sales representative. He will headquarter at the Huntington Park, Calif., plant.

■ **Edward P. Fleischer**, formerly assistant to the president, has been named assistant director of the electro mechanical instrument division of Consolidated Electro-dynamics Corp. at Pasadena, Calif.

■ **Edward H. Nunn** has been named to fill the newly created position of assistant to the general manager, chemical products division, Crown Zellerbach Corp. at Camas, Wash.

■ **Lee S. Cline** has been named vice president, production, and **T. R. Rooney** special assistant to the president, Consolidated Western Steel Div. of U. S. Steel Corp., Los Angeles.

■ **Joseph C. Profita** has been named general manager of Narmco Resins & Coatings Co. of Costa Mesa, Calif.

■ **Jack Walker** has been named director of marketing for Librascope-Burbank, according to **Richard Hastings**, vice-president.

■ **William C. Hitt** is new executive director of ultrasonics for Automation Industries, Inc. plants at Pasadena, Van Nuys and Paramount, Calif.

■ **Chester H. Johnson** is the newly appointed manager of public relations for Varian Associates, Palo Alto, Calif.

■ **Ernest Murillo** has been appointed Western division service manager for Non-Linear Systems, Inc., Del Mar, Calif.

■ **Richard B. Leng** is heading the new group concerned with advanced military and industrial electronics at Packard Bell Electronics Corp.

■ **Philip S. Fogg**, **Dr. Robert F. Bacher** and **Dr. Frederick C. Lindvall** have been elected to the board of directors of Bell and Howell. All three were formerly directors of CEC.

■ **Sam D. Vaughan** has been appointed superintendent mechanical shops and field crews at Kaiser Steel's Fontana plant.

■ **W. R. Jennings** is new Southern California representative for the Hallidie Machinery Co. He will headquarter at Lynwood.

■ **Frank Roodman** has been named assistant manager of the Austin Co.'s five-state western district with headquarters in Los Angeles.

■ **Harley W. Weide** has been appointed district representative of Hobart Brothers Co. for Southern California, Arizona and New Mexico.

■ **John F. Bonner** has been elected vice president of Pacific Gas & Electric Co. in charge of engineering to succeed **Walter Dreyer**, who is retiring after 43 years with PG&E.

■ **W. Harlow Waggoner**, San Jose, Calif., has been re-elected president of California Processors and Growers, Inc.

New Office Building For Sperry Engineering

SALT LAKE CITY—Target date of July 30 has been set for completion of the \$1,200,000 office building at Sperry Utah Engineering Laboratory, 322 N. 21st West, which is responsible for production of the entire Sergeant missile system.

Paul W. Vestigo, manager of the facility, said upon completion of the new building, existing facilities will be used primarily for manufacturing activity.

American Machine & Metals Names LA Distributor

LOS ANGELES — The W. A. Plummer Mfg. Co., 752 S. San Pedro St., here, has been appointed a distributor for the Feon Filtration Fabrics Div. of American Machine and Metals, Inc. of East Moline, Ill.

The Plummer Co. will represent Feon industrial fabrics, designed for all fluid or solid separation equipment.

Ziegler Steel Service Opens Fresno Office

FRESNO, CALIF.—Ziegler Steel Service Corp., steel distributors in Los Angeles and Oakland, have opened an office here under the direction of **Phil H. Philips**. The new office will draw on complete inventories of steel, aluminum and copper in both Northern and Southern California.

Two New Distributors For Spectrol Electronics

SAN GABRIEL, CALIF. — The Flight Electronic Supply Corp. at 423 So. Hindry, Inglewood, Calif. and the Atlas Electronics, Inc. at 4618 Santa Fe St., San Diego, have been named distributors for Spectrol Electronics Corp.

Spectrol manufactures precision wire-wound potentiometers.

Litton Industries Opens Electron Tube Division

SAN CARLOS, CALIF. — A new 43,000 sq. ft. addition to its Electron Tube Div. building was activated recently by Litton Industries here at 960 Industrial Rd. The facility and new electronics equipment represents a \$2,000,000 investment.

The new addition also houses the firm's Electronic Display Lab which has been moved from Emeryville, Calif.

CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are 1/8 inch short of contracted space to allow for borders and composition. Rates are \$16.00 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 25th if no proofs are required.

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Contract News for the West

LOS ANGELES—The U. S. Army Ordnance District, Los Angeles, announced the award of over \$7,000,000 in Army Ordnance contracts for January and on Feb. 12 another \$4,500,000.

The larger awards went to *California Institute of Technology, Pasadena*, \$3,337,728 for research and development work; *Douglas Aircraft Co.*, Santa Monica, \$2,667,475 for Nike Hercules missile launching area items and \$340,095 for Nike missile repair parts and launching area items; *Sperry Utah Engineering Lab*, Salt Lake City, \$975,000 for research and development of the Sergeant guided missile system, \$264,649 for repair parts and ground equipment and \$800,000 research and development.

North American Aviation, Inc., Missile Div., Downey, Calif., \$324,162 for design and structural analysis and a \$47,952 research and development contract for a digital computer. The Rocketdyne Div., Canoga Park, Calif., classified contracts for \$115,000 and \$87,260.

Eidal Mfg. Co., Albuquerque, N. M., a \$940,980 contract for trailers. *Aerojet General Corp.*, Downey, a \$481,500, classified contract. *Gilfillan Bros., Inc.*, Los Angeles, \$400,000 for Nike system components. *Telemetering Corp. of Am.*, Sepulveda, Calif., \$140,972 for technical services. *Huford Corp.*, El Segundo, Calif., \$112,056 for spherical bulkheads.

Other awards from the Los Angeles District included: *Plasmadyne Corp.*, Santa Ana, \$86,662 research and tunnel development; *Norris-Thermador Corp.*, Vernon, \$87,260 for storage and maintenance of facilities; *Ordnance Specialties, Inc.*, El Monte, \$83,125 for a powder actuated cutter; *Electro-Optical Systems, Inc.*, Pasadena, \$75,633 for study and development of a microbaroswitch; *Rheem Mfg. Co.*, Downey, \$75,000 classified contract; *Task Corp.*, Anaheim, \$72,085 for wind tunnel test equipment; and *Hughes Tool Co.*, Culver City, \$64,895 research and development for fabrication of links.

Other companies receiving smaller contracts in Southern California in-

clude: *Radio-plane*, Van Nuys, \$57,319; *W. C. Dillon & Co.*, Van Nuys, \$42,563; *Aeronutronic*, Newport Beach, \$39,725; *Vickers, Inc.*, Torrance, \$36,955; *Harvey Aluminum, Inc.*, Torrance, \$35,116; and *Waste King Corp.*, Los Angeles, \$28,083.

Military and government contract news recently reported to WESTERN INDUSTRY also includes: *Packard Bell Electronics'* new Defense and Industrial Group, Los Angeles, a \$2,000,000 contract from the Dept. of Navy, Bureau of Naval Weapons for production of ASQ-17B integrated electronic central; *AiResearch Mfg. Div.*, Garrett Corp., Phoenix, a Navy contract for 286 small gas turbine engines; *Instrument Div.*, *Burton Mfg. Co.*, Santa Monica, two U. S. Air Force contracts for \$100,000; *Electronic Engineering Co.* Santa Ana, a \$60,000 contract from Sandia Corp., Albuquerque, for design and construction of data translation equipment.

Rohr Aircraft Corp., Chula Vista, Calif., received orders for more than

\$9,500,000 in follow-on business involving components for four different military aircraft, the largest order from Boeing.

Fischbach & Moore, Inc., Los Angeles, electrical contractors, have been awarded a contract for approximately \$1,700,000 for electrical work on nine Atlas missile launching sites in three Western states.

Telecomputing Corp., Los Angeles, received a \$2,084,222 contract from the Dept. of the Army to provide research and developmental data reduction services at Holloman Air Force Base on the White Sands Missile Range, Alamogordo, N. M. and also add-on contracts in excess of \$535,000 from Boeing; *Tracerlab's* Reactor Monitoring Center in Richmond, Calif., has been awarded contracts totalling about \$175,000 for two reactor monitoring systems.

Plummer Mfg. Named Rep.

LOS ANGELES—The W. A. Plummer Mfg. Co., 752 S. San Pedro St., here, has been appointed the master distributor for filter paper manufactured by the Eaton-Dikeman Co. of Mount Holly Springs, Pa.

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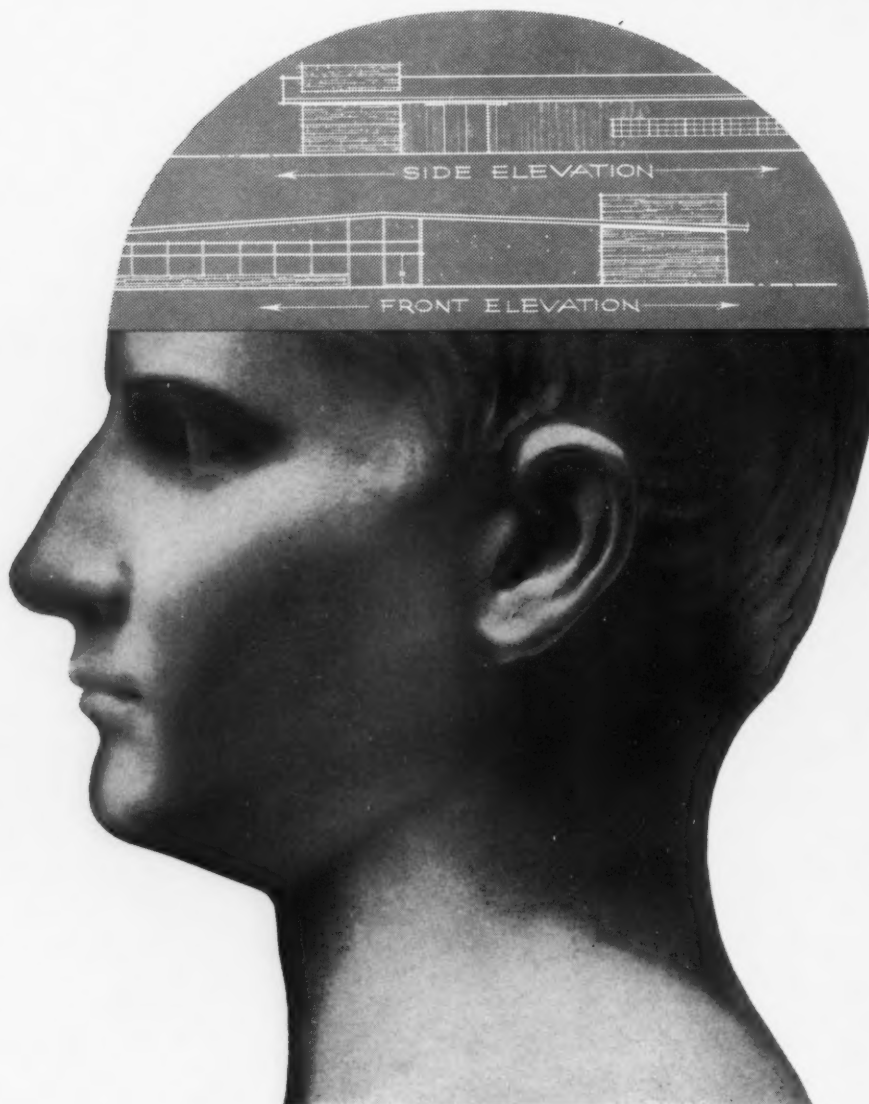
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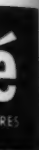
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